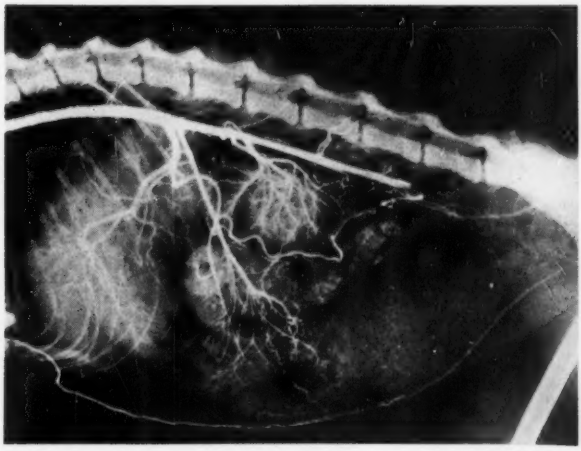
Annual AVMA Meeting
Detroit, Michigan
August 20-24, 1961

Journal

OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION



Aortogram of cat with "saddle embolus" at the iliac bifurcation.
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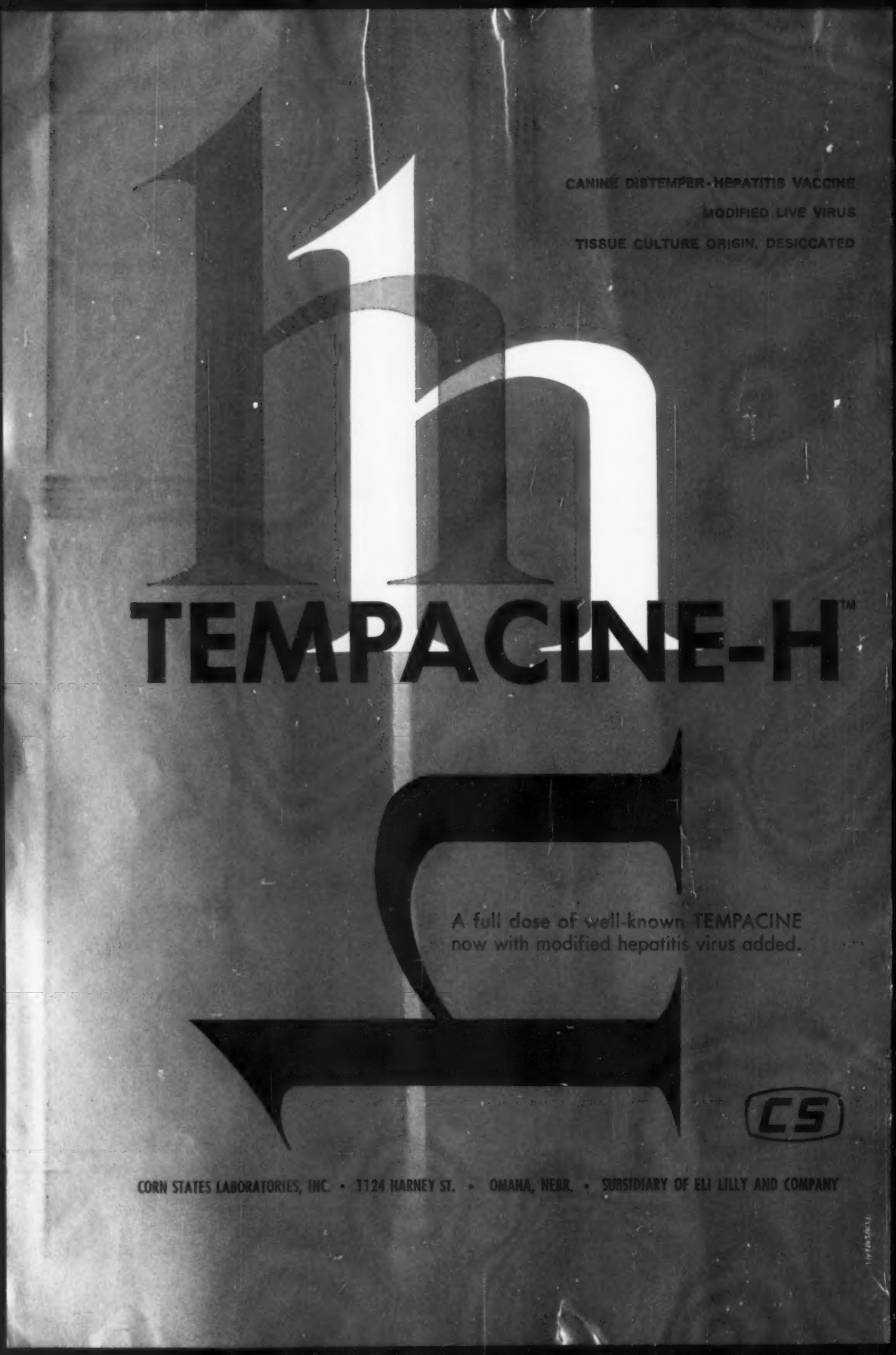
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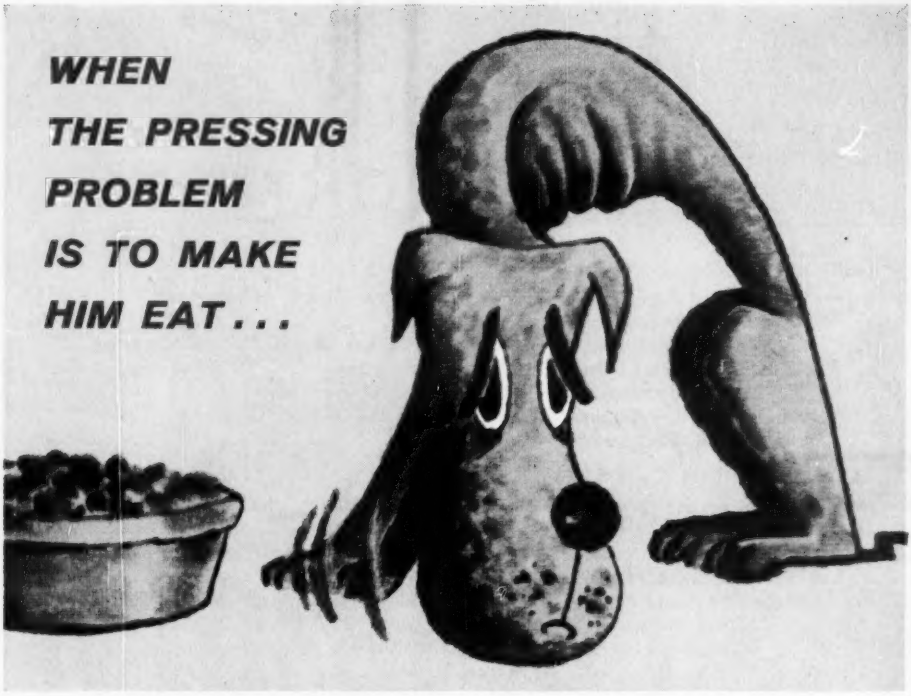

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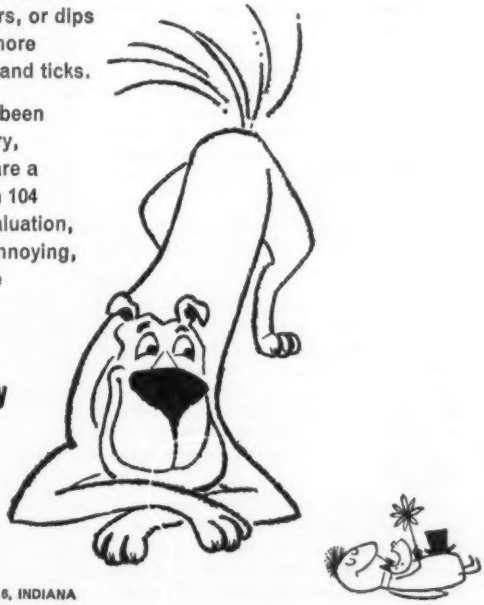

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2) *Manuscripts*, including footnotes, references, tables, and legends, must be typewritten, double-spaced, on 8½- by 11-inch bond paper, and the original and one carbon copy should be submitted. One-inch margins should be allowed on the sides with 2-inch margins at the top and bottom. Articles should be concise.

Purpose of the article should be stated in the introduction. Summary should be included.

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[8]Mansson, J., and Obel, N.: The Technique of Adrenalectomy in the Ruminant. Cornell Vet., 48, (1958): 197-201.

When books are cited, name of publisher, location, edition, year of publication, and pages concerned should be given.

[1]Arey, L. B.: Developmental Anatomy. 5th ed. W. B. Saunders Co., Philadelphia, Pa. (1946): 236-240.

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Sufficient information should be included to allow the illustration to be understood without reference to the text.

Before submitting a manuscript, authors are urged to consult previous JOURNALS for appropriate style. The AVMA reserves the right to reject any manuscript.

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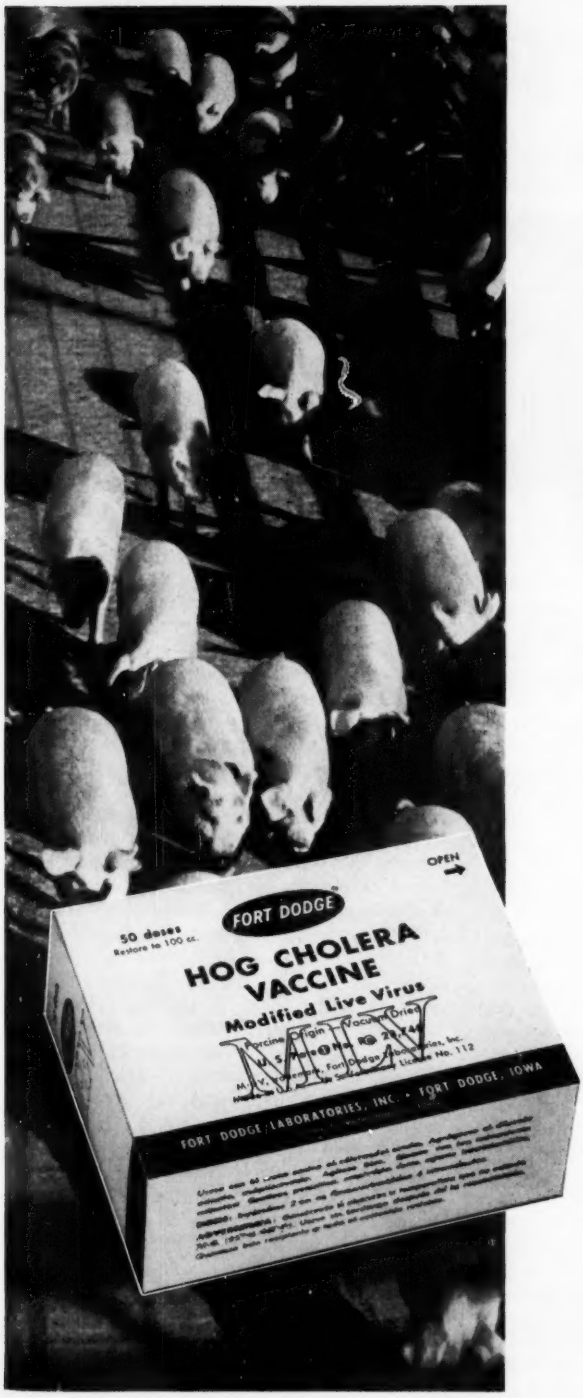

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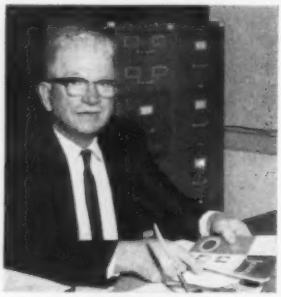
The Detroit Meeting

The AVMA invites all veterinarians and their families to attend the 98th Annual Meeting of the American Veterinary Medical Association in Detroit, Mich., Aug. 20-24, 1961.



Dr. E. E. Leasure, President

AVMA conventions have long been family affairs. Cities are carefully picked so that vacations can be combined with convention activities. Local arrangements committees plan activities for veterinarians as well as their wives and children. This year's convention in Detroit offers splendid education and recreation opportunities for the entire family.

More than 100 papers will be presented at the scientific sessions of the convention. There will be 24 detailed scientific exhibits and about 140 commercial exhibits. There will be 14 section meetings, 12 closed-circuit television presentations, and meetings of organizations closely allied to AVMA. The convention offers veterinarians perhaps the broadest range of opportunities for continuing education in veterinary medicine to be found in a single location at one time.

All of these activities will be held in Detroit's new Cobo Hall, with better facilities and more space than have ever before been acquired for an AVMA convention. The exhibit, registration, and friendship areas will occupy over 99,000 square feet. Meeting rooms in Cobo Hall have been assigned for the presentation of scientific papers.

Remember, it is your AVMA, and it is your convention. The policy-making body of the Association will meet at Detroit and decisions affecting the future of every veterinarian will be made there by the delegates and by Executive Board members. Veterinarians at the convention have a special chance to make their thoughts and desires known through these people who need the guidance and support that veterinarians from their districts or states can give them by attending the convention and being available for consultation.

Whether he's interested in flying, writing, or socializing, the veterinarian who attends the Detroit convention will find that he's been taken care of. For flyers, the new Flying Veterinarians Association will meet in Detroit—for writers, a conference for veterinary writers has been planned — for socializers, friendship areas at Cobo Hall, alumni dinners, the president's reception, and the general camaraderie of thousands of veterinarians.

The Women's Auxiliary to the AVMA has planned many activities, including tours of Detroit and Canada and the formal Auxiliary tea. Meetings of the Auxiliary House of Delegates, Executive Board, and committees have been scheduled. The wives, of course, will also attend the president's reception.

Special programs and tours have been planned for teens and subteens by the local committee on arrangements of the women's auxiliary.

Detroit, the motor city, offers many attractions for the entire family. Automobile plants, the lifeblood of Detroit, offer tours which show the production of cars, from beginning to end. The Henry Ford Museum and Greenfield Village in Dearborn, Mich., are most popular attractions.

Across the border in nearby Canada, visitors will find opportunities for fishing, hunting, and touring. Tourists crossing the border are advised to carry birth, baptismal, or voters' certificates. Naturalized citizens should bring naturalization papers. Aliens should consult with Canadian representatives in their countries to obtain valid travel visas, if required.

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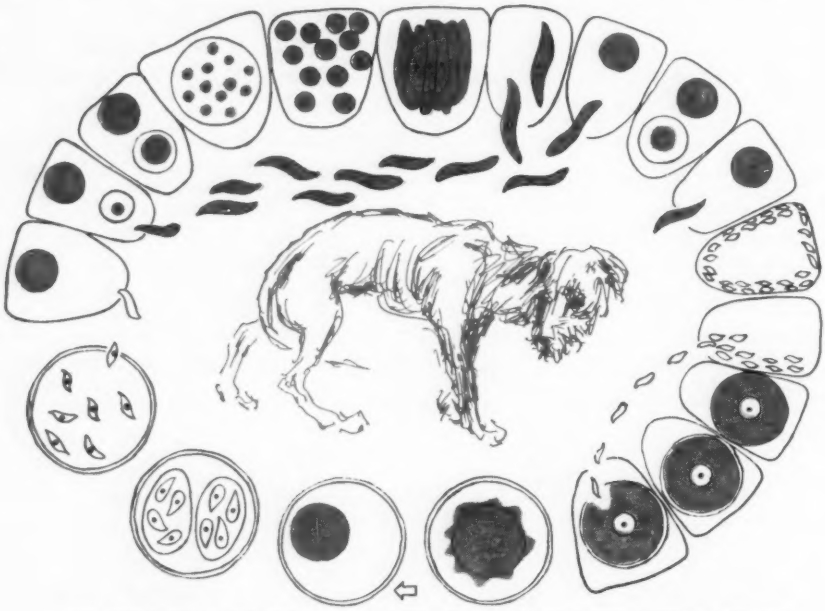
COCCIDIOSIS:

"a very common infection"[1]

IN THE CANINE

Coccidiosis in the dog has been shown to be quite common.[1,2] Since coccidia may cause death in heavily infected young animals,[3] an understanding of this potentially serious disease should prove of interest to the veterinarian with a small animal practice.



ADAPTED FROM: MORGAN, B. B., AND HAWKINS, P. A.: VETERINARY PROTOZOOLOGY, BURGESS PUBLISHING COMPANY, MINNEAPOLIS, MINN., 1952.

The Classical Cycle of Isospora bigemina. The coccidia undergo repeated cycles of asexual multiplication (schizogony) finally terminating in formation of sexually differentiated *gametes*, which combine to form *zygotes*. At this stage a protective covering is formed. Sporulation (sporogony) may occur within the intestinal tract or after the oocyst is discharged in the feces of the host, depending upon the stage of the infection. When ingested by a new host, the *sporozoites* escape from the oocyst and enter the intestinal epithelium to repeat the cycle.

The Classical Signs of Coccidiosis. The predominant signs of coccidiosis in severe cases are bloody diarrhea, general weakness, anemia and rapid progressive emaciation. Oocysts will usually be found in the feces 5 to 6 days after the infection begins. The animal is depressed and weak and loss of appetite may be observed. It is important to note that at the outset of signs "coccidiosis may occasionally be confused with distemper."[2] Since the disease may be rapidly progressive, early therapeutic measures are necessary to improve the dog's chances for survival.

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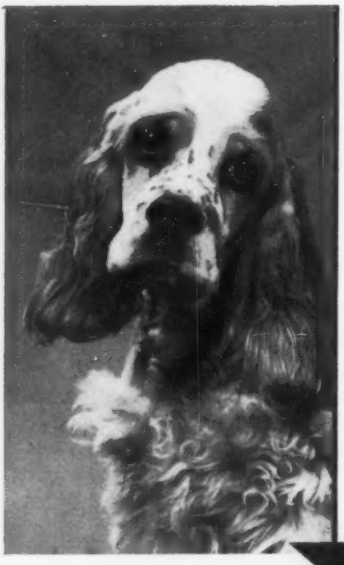

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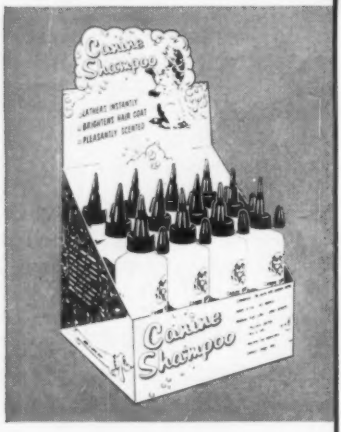

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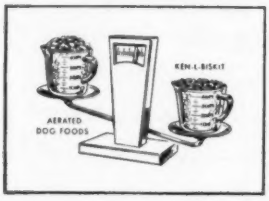

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news from Washington . . .

FROM THE AVMA WASHINGTON OFFICE
J. A. McCallam, VMD
Brig. Gen. USA (Ret.)

LEGISLATION

USDA Appropriation

H. R. 7444—USDA appropriations bill for fiscal year ending June 30, 1962, was passed by the House, June 6. The total of $5,948,566,000 includes:

ARS—research programs, $76,588,000; plant and animal disease and pest control, $55,165,000, of which $450,000 is to staff the control and regulatory activities of the new Ames (Iowa) Laboratory, $400,000 is for additional plant inspectors, and $345,000 is due to reclassification of veterinary positions; meat inspection, $24,216,000, of which $675,000 is for 108 additional meat inspectors, and $415,000 is due to reclassification of veterinary positions (see JOURNAL June 15, 1961, adv. p. 12, in regard to the latter).

AMS—marketing research and service, $37,702,000, including $4,515,000 for marketing research, and $33,187,000 for marketing services, of which $12,988,700 is for poultry inspection; the latter includes $500,000 due to reclassification of veterinary positions.

The Senate Committee on Appropriations reported out *H. R. 7444* (Senate Report 394) on June 15. Among recommended increases are: $175,000 for a plant quarantine item; $200,000 to accelerate cooperative eradication program for sheep scabies; and $250,000 to accelerate research on air-sac diseases, divided equally between research on broilers and turkeys.

NEW BILLS

Hog Cholera Eradication

H. R. 7694, Rep. Matthews (D., Fla.), and *H. R. 7702*, Rep. (Mrs.) Blitch (D., Ga.)—To provide for a national hog cholera eradication program. Bills are identical to those introduced previously (see JOURNAL June 15, 1961, adv. p. 12, and p. 677).

Wild Animal Importation

H. R. 7629, Rep. Wharton (R., N.Y.)—To amend Tariff Act of 1930 to provide free importation of wild animals, birds, and reptiles intended for exhibition in the United States.

Aid to Agricultural Research

H. R. 7480, Rep. Harvey (R., Ind.)—To assist states in providing additional facilities for research at state agricultural experiment stations.

Import Quota on Sheep and Lambs

H. R. 7654, Rep. Clem Miller (D., Calif.)—To provide for tariff import quota on sheep, lambs, mutton, and lamb.

Livestock Purchasing by Packers

S. 2044, Sen. McCarthy (D., Minn.)—To clarify the authority of the Secretary of Agriculture to require reasonable bonds from packers in connection with their livestock purchasing operations.

(Continued on page 176)

SINGLE DOSE AFFILIATED BRAND COMBINED CANINE DISTEMPER VACCINE AND INFECTIOUS CANINE HEPATITIS VACCINE INDUCES IMMUNITY TO CHALLENGE OF VIRULENT DISTEMPER AND HEPATITIS VIRUSES

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Washington News—continued

New HEW Assistant Secretaries

S. 2073, Sen. Hill (D., Ala.)—To authorize 2 additional assistant secretaries in Department of Health, Education, and Welfare; is an Administration-backed bill with passage likely. Would also abolish the office of special assistant to the Secretary (in charge of Health and Medical Affairs), raising the position to that of assistant secretary. The present special assistant, Boisfeuillet Jones, is not a physician as the 4 previous encumbents in the Eisenhower administration were. The other assistant secretary provided would be concerned with international affairs.

President's Advisory Council on Education

S. 2063, Sen. Case (N. J.), Cooper, Bush, and Javits—To establish a President's Advisory Council on Education. Council would be composed of 9 members, who are leaders in the field of education and science, appointed by the President with the advice and consent of the Senate. Each member would hold office for a term of 4 years.

Peace Corps Appropriations

S. 2000, Sen. Humphrey, Fulbright, Pell, Clark, Smith (Mass.), McGee, Hart, and Gore—To provide for a Peace Corps to help peoples of interested countries in meeting their needs for skilled manpower. The authorization, not to exceed $40,000,000, would be appropriated to the President for fiscal 1962 to carry out the purposes of the Peace Corps Act. Would provide for the enrollment in the Corps of qualified citizens and nationals of the United States for service abroad.

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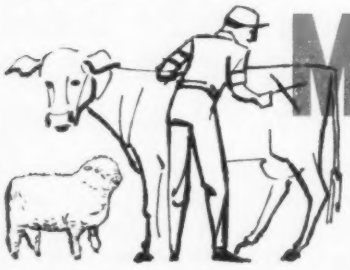

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PR Round Table Produces Idea Exchange

Ideas on how best to improve veterinary public relations across the country were freely and informally exchanged at the AVMA Public Relations Round Table in Chicago, May 20-21, 1961.

Problems of veterinary public relations and possible solutions to them were put under fire by the 37 round-table participants. Representatives of 25 state veterinary medical associations and 2 Canadian provinces and AVMA staff and officers participated in the program.

"How can concerted efforts by all segments of AVMA—from the individual member to the national office—dispel the widespread public ignorance of the dimensions of veterinary medicine and its value to society?" was the basic theme of all discussion.

In his kick-off comments, Heinz R. Kuehn, AVMA director of public information, emphasized that any veterinary public relations program is founded upon 2 basic requirements: communication and responsible participation. "Good performance plus public understanding and appreciation of that performance equals good public relations," he said. "Unless we inform the public about the veterinary profession, and unless you in your states and communities do likewise, our efforts to participate in community, state, and national affairs will be largely wasted.

"With good public relations, the public will recognize the value of your services and will be willing to reward you adequately for them," Mr. Kuehn continued. "The public will understand why it has a personal stake in the support and progress of veterinary medical research. People will acquire a sympathetic and understanding view of legislation that affects veterinary medicine, and parents will be more willing to send their children to veterinary schools because they will recognize the status and the significance of veterinarians.

"Without communication," he concluded, "the profession cannot hope to reap the fruits of its efforts. Likewise, the profession cannot hope to be fruitful unless each of its members fulfills his civic and professional responsibilities."

The round table was planned so that all in attendance would actively participate. Discussion themes relating to state veterinary association public relations, the national program, and combined state and national efforts were choosen, moderators were appointed, and participants fired away with questions. Answers were given by anyone who thought he might help.

The discussion on combined state and national public relations efforts drew a particularly animated response. The tenor of this discussion was probably best summed up by Mr. Ray Thomson, public relations counselor to the Maryland and Pennsylvania V.M.A.'s. He said, "How much attention should be given to closer integration of state and national programs? We fear that there are so many divergent programs—national, regional, state, local—that perhaps all of us are going down a different road. Sooner or later, we will find that we have not carried on good public relations at all, but that we have put ourselves into a box from which it will be difficult to escape. There must be some effort toward a more 'integrated' public relations program throughout the nation."

Dr. S. R. Monroe (AUB '50), public relations chairman of the Alabama V.M.A., re-emphasized this thought by calling for an "over-all" national program, the objectives of which are designed to be carried out on the state level, but which is coordinated by the national AVMA headquarters.

Throughout the discussions, round-table participants expressed a strong feeling that increased AVMA leadership and support was mandatory in an integral veterinary public relations program.

Dr. Mark L. Morris (COR '26), AVMA

Public Relations Round Table participants are shown here. They are (standing, left to right): Dr. George Kuker, Ohio; Mr. L. T. Maloney, Massachusetts; Dr. S. J. Levine, Massachusetts; Dr. Donald A. Price, AVMA editor-in-chief; Mr. Larry Taylor, Texas; Miss Carol Hatcher, secretary to the director of public information; Mr. Brian Forster, Illinois; Dr. J. W. Skaggs, Kentucky; Dr. Jack I. Denton, Vermont; Dr. Tom M. Wise, Illinois; Dr. Hoyt Hall, Florida; Mr. Heinz R. Kuehn, AVMA director of public information; Dr. Jordan R. Dann, Connecticut; Mr. LeRoy Galperin, New York; Dr. Samuel R. Monroe, Jr., Alabama; Dr. Harry E. Kingman, Jr., AVMA executive secretary; Mr. S. C. Steiger, New York; Dr. Arthur Freeman, AVMA assistant editor; Dr. Carl E. Keely, Idaho; Dr. Paul Nees, Wisconsin; Dr. Arthur J. Blaney, Maryland; Dr. F. Murray Iobst, Pennsylvania; Miss Joyce Ludwig, AVMA news editor; Mr. Richard Morrison, AVMA administrative assistant; Mr. Ray Thompson, Maryland.

Seated (left to right) are: Mr. Jack Kroeck, Missouri; Dr. Harry L. Newell, West Virginia; Dr. Gordon E. Johnson, Indiana; Dr. W. Turnbull, Saskatchewan, Canada; Dr. Mark L. Morris, AVMA president-elect; Mrs. D. W. Clarke, Washington, Auxiliary PR chairman; Dr. B. S. Pomeroy, Minnesota; Dr. C. D. Lee, Iowa; Dr. F. D. Wertman, Iowa; Dr. J. M. Glenroy, Ontario, Canada; Mr. Claude Ramsey, Colorado; Dr. William A. Knapp, Jr., Georgia.

president-elect, acknowledging this conviction, pointed out that "many of the problems you have been discussing here in the past 2 days have been on the agenda of AVMA's Board of Governors and have been under careful scrutiny and inspection.

"In the few months that I have served on the Board," he continued, "it has become apparent to me that the AVMA has a very large show on the road. I want to tell you, so that you can go back home and tell your members, that there is much being done."

Dr. Morris explained that AVMA needs to increase both qualified personnel and funds to provide the leadership which the membership demands.

"Money and brains," he said, "can take the veterinary profession and really push it forward in the years that are right ahead. The challenges are great. There was never a greater opportunity for the profession than in the next decade."

Other questions submitted to moderators before discussions were along these lines—"How can science fairs and exhibits be used best as a method of disseminating information about the veterinary profession?" "What should be done to obtain general recognition of the veterinarian as a professional man?" "Could a step-by-step procedure for developing a state veterinary public information program be drafted?"

During the meeting, Mr. Kuehn pointed out that the AVMA Centennial should be the focal point of all public relations activities for the next 2 years. He said, "Centennial activities are in essence public relations programs. The main objectives of the profession's centennial celebration are public relations or, if you will, public information objectives. These objectives can only be achieved with participation by the entire membership—individual, local, state, and national—under the leadership of the AVMA.

Mr. Kuehn indicated 5 main targets for the centennial:

1) To direct the attention of the American public to the current status of veterinary medicine as a health profession and to the progress made in the last century by the AVMA.

2) To renew the interest of members and constituent and local associations in the present and future programs of the AVMA.

3) To provide, during the centennial year, enlarged opportunities for special programs by local and state veterinary medical associations in as many communities as possible.

4) To give evidence, largely through the scientific program of the centennial meeting, of the continued leadership of American veterinary medicine.

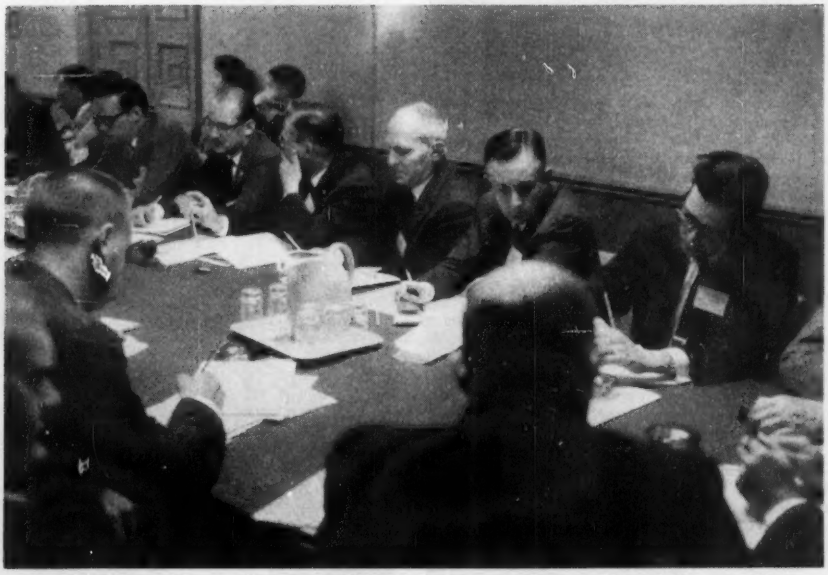
5) To interest American leaders and the public in the needs and resources of the

veterinary medical profession, and in the profession's contributions to health and the national way of life.

Mr. Kuehn described the centennial activities that were being planned by AVMA's Centennial Committee and indicated that the AVMA office would make available to state and local associations a Centennial Kit containing material designed to guide these associations in carrying out centennial activities.

Pictures of some AVMA public relations round-table participants and their comments follow.

"You are tied in to a large and dynamic program," Dr. Mark L. Morris, AVMA president-elect, told the public relations representatives. Dr. Morris told of the experience he and the AVMA Board of Governors have had in dealing with government officials and leaders of allied health professions. "I have been agreeably surprised and pleased to see the stature that has been built for the profession," he said.



Round-table participants discuss possible solutions to veterinary public relations problems.

"Communication and participation go hand in hand," said AVMA director of public information, Heinz R. Kuehn, in opening the meeting. "Public relations is 90% good performance and 10% communication about that good performance."

Mr. Fahey Flynn, radio and television newscaster and commentator, related the inside story of "electronic journalism," elaborating on the main requirements for an effective relationship between the broadcasting industry and public relations men.

Dr. Samuel R. Monroe, Jr., Alabama
"AVMA should make sure that every state has a PR chairman and program consisting of the basic components to get started. A crash program should be begun immediately to fill our needs in 2 areas: (1) high school recruitment of students for careers in veterinary medicine; (2) a hospital inspection or evaluation program on a state level. We need columns on animal health in the weekly papers, especially in the small towns across the country. These columns should be put out by the AVMA and sent to state PR chairmen for distribution. In working toward an effective public relations program, we must never forget that sometimes our fields of greatest resistance are with our own veterinarians."

An outside view of the profession's status and opportunities was provided by 2 prominent representatives of the communications field. Theodore R. Van Dellen, M.D., shown here, spoke about "Science in the News." He is president of the Chicago Medical Society and health editor of the *Chicago Tribune*, New York News Syndicate. He described the advantages and pitfalls of writing a daily health column. He also appraised the value of news releases prepared by public relations men.

Dr. H. C. Hall, Florida

"Every veterinarian applauds Mr. Kuehn's statement that public relations is 10% communications and 90% participation. The time has come for us to face up to the fact that the average animal owner's conception of the veterinary profession is a composite picture of the veterinarians he knows. The only way we are going to make any real improvement in our public image is to improve our public service. All the news releases Mr. Kuehn can issue this year will not undo the damage done if one client of each veterinarian here loses one animal because he cannot get a veterinarian this weekend.

"I have 3 suggestions to offer to the AVMA public relations program. First, AVMA should encourage the formation of local societies in every county or group of counties where one does not exist. Second, I propose that AVMA urge, cajole, or coerce the establishment of an emergency telephone answering system in every town in the U.S. in which 2 or more veterinarians practice. Third, I urge that Dr. Morris' remarks to us today be tape recorded in many copies, so every state and local society can hear them. I have never heard AVMA's activities and aims expressed so well."

Dr. William A. Knapp, Jr., Georgia

"An effective public relations program is the result of and not a matter of a strong organization. Communications within our profession have been poor and the same can be said of communications to the public. The AVMA and all constituent veterinary medical associations should give great emphasis toward improving both internal and external public relations programs. It is difficult to say which is the more important at this stage of our development. Public relations is our number one problem. News releases, stories, articles, pictures, and radio and television time are only a small part of a public relations effort. More important is the basic character of the organization sponsoring the program. A dynamic, enthusiastic, disciplined, confident organization will have the same kind of public relations program. This type of organization results only from inspired and courageous leadership. In order for AVMA to become the organization it should be, and for it to have the influence and prestige it should have, much work needs to be done. It is imperative that our national organization be strengthened and made more effective because tomorrow's problems and opportunities will require that every veterinarian be strongly represented by a highly capable, well-financed organization directed by vigorous leaders. This means that the AVMA will require more support, financial and otherwise, from its members because AVMA can support its members only to the extent that they support it."

AVMA Awards 11 Fellowships

The Council on Research of the AVMA has announced that 11 fellowships have been awarded for the year 1961 to 1962.

The total expenditure of the AVMA Research Fund to support these 11 fellows will be $37,008. The grants were awarded to veterinarians who are pursuing further training in teaching and research.

Most of the funds for this year's grants were secured for the fund by the fund-raising campaign of the Women's Auxiliary to the AVMA.

Of the 11 grants awarded, 2 were renewals. The 11 fellowship recipients are:

Dr. Jacques A. Godu (QUE '60), Ontario Veterinary College, Guelph, received a 12-month renewal of his AVMA fellowship.

Dr. Godu is working under Dr. A. A. Kingscote (ONT '28) in the Department of Parasitology, Ontario Veterinary College. His research project involves cogenesis in nematodes. When he completes his work, he plans to do teaching or research work at a veterinary school.

Dr. Jacques A. Godu

Dr. C. L. L'Ecuyer

Dr. C. L. L'Ecuyer (QUE '57) also was awarded a 12-month renewal of his AVMA fellowship by the Council on Research.

Dr. L'Ecuyer is conducting his work in pathology, particularly diseases of swine, under Dr. W. P. Switzer (TEX '48). He plans to teach and do research when his project is completed.

Dr. Delwin L. Bokelman (KAN '58) was awarded a 12-month fellowship by the AVMA Council on Research.

Dr. Bokelman is at Cornell University working toward his Ph.D. degree in veterinary pathology. He proposes to complete a research project on pathogenesis of growth-hormone-induced spondylosis deformans in rats. His major professor is Dr. Lennart P. Krook, Department of Pathology and Bacteriology, New York State Veterinary College. Dr. Bokelman would like to conduct research on the pathology of diseases of veterinary interest, especially nutritional diseases, or to teach pathology in a veterinary school and conduct part-time research when his project is completed.

Dr. Delwin L. Bokelman

Dr. J. M. Carter

Dr. J. M. Carter (MSU '51) has been awarded a 12-month AVMA fellowship by the Council on Research.

Dr. Carter will work toward his Ph.D. degree. His project will be on arthritis in swine. His major professor will be Dr. George N. Neher, Department of Physiology and Pharmacology, School of Veterinary Science and Medicine, Purdue University.

Dr. Carter, who has been in large animal practice for the past 10 years, would like to work in teaching and research after he receives his Ph.D. degree.

Dr. Barton L. Gledhill

Dr. Barton L. Gledhill (UP '61) has been awarded an AVMA fellowship by the Council on Research for 12 months.

Dr. Gledhill will study obstetrics and gynecology as a fellow of the Royal Veterinary College, Stockholm, Sweden. He will work under Dr. Nils Lagerlof, chairman of the Department of Obstetrics and Gynecology at the college.

Dr. Gledhill hopes eventually to do teaching and research in obstetrics and gynecology.

Dr. Joe P. Morgan

Dr. Joe P. Morgan (COL '60) has been awarded a 4-month fellowship for summer study by the AVMA Council on Research.

Dr. Morgan is working toward his M.S. degree in veterinary radiology. During the 4 months of his fellowship he will work under Dr. Eugene Pendergrass, head of the Department of Radiology, University of Pennsylvania Medical School. He will then return to Colorado State University to complete requirements for his degree. His major professor in graduate study is Dr. William D. Carlson (COL '52). Dr. Morgan hopes eventually to do full-time teaching and research in clinical radiology.

Dr. Murray E. McMullen (ONT '61) has been awarded a 12-month AVMA fellowship by the Council on Research.

Dr. McMullen will work toward his M. S. degree at the University of California, Davis, under Dr. C. E. Cornelius (CAL '53), Department of Clinical Pathology, School of Veterinary Medicine. His study will be on bile pigments of domestic animals in health and disease.

Upon completion of his project Dr. McMullen hopes to enter general practice or to teach.

Dr. Murray E. McMullen

Dr. David D. Myers (MIN '57) has been awarded a 12-month AVMA fellowship by the Council on Research. He will work toward his Ph.D. degree in veterinary pathology.

Dr. Myers will work under Dr. L. E. Hanson (MSU '50) at the University of Illinois. Since 1957 he has worked as director of the Poultry Disease Diagnostic Laboratory, Florida Livestock Board; animal pathologist, Illinois State Department of Agriculture Diagnostic Laboratory; and instructor in veterinary pathology and hygiene, College of Veterinary Medicine, University of Illinois.

After completing requirements for his degree, Dr. Myers hopes to take a position in which he can obtain additional experience in pathology and engage in research. Later he would like to teach.

Dr. David D. Myers

Dr. William M. Newton

Dr. William M. Newton (ILL '52) has been awarded a 12-month AVMA fellowship by the Council on Research.

Dr. Newton, who has been in general practice since 1952, is working toward his M.S. and Ph.D. degrees. He is particularly interested in research in veterinary physiology and will study under Dr. Roger Link (ISU '34), College of Veterinary Medicine, University of Illinois.

Dr. Newton plans to teach and do research in veterinary physiology after he has received his degrees.

Dr. John B. Tasker

Dr. Tasker is working toward his Ph.D. degree in the Department of Pathology and Bacteriology at New York State Veterinary College, Cornell University. His major professor is Dr. John Bentinck-Smith (COR '44). His study is concerned with the cause of abomasal ulcers in cattle. Since 1957 Dr. Tasker has worked as a medical intern in the Ambulatory Clinic, New York State Veterinary College; small animal practitioner; and as instructor in the Department of Pathology and Bacteriology, New York State Veterinary College. He also spent some time at Walter Reed Army Medical Unit when he was in the Army.

Dr. Tasker hopes to obtain a faculty position in clinical pathology or clinical teaching after he receives his degree.

Dr. Nicolas S. Platonow (ONT '57) has been awarded a 12-month AVMA fellowship by the Council on Research.

Dr. Platonow, who is working toward his Ph.D. degree, is studying under Dr. L. P. Dugal, Department of Biology, Faculty of Pure and Applied Science, University of Ottawa. His study is concerned with liver enzymes in subtotally hepatectomized rats.

After he receives his degree, Dr. Platonow plans to return to the Ontario Veterinary College, Division of Pharmacology, where he received his M.S. degree, to teach and continue research.

Dr. Nicolas S. Platonow

Dr. John B. Tasker (COR '57) has been awarded a 12-month fellowship by the AVMA Council on Research.

Chicago Veterinarians To Support AVMA Fellow

Members of the Chicago V.M.A. laid plans recently to raise funds for the support of at least one AVMA Fellow each year. The plan, which is unique for a local veterinary association, was developed in May.

The association is now conducting a drive to raise $10,000 from Chicago V.M.A. members to augment funds already raised this year by the association's auxiliary. Each officer and member of the Chicago V.M.A.'s executive board has already contributed $100 to the program.

The association decided to launch the program when it learned that only 1/3 of the more than 20 qualified applicants for AVMA Fellowships could be awarded grants for 1961-1962 due to the financial condition of

the fund. The group hopes to gather enough funds so that additional candidates can be supported for the coming academic year. AVMA Research Fund trustees have already made 2 additional fellowship grants this year in anticipation of receipt of funds from the Chicago V.M.A. drive.

The Chicago program was activated at a kick-off dinner May 9, attended by more than 30 veterinarians who had volunteered to act as fund raisers.

Representing the AVMA at the dinner, Dr. L. Meyer Jones (ISU '39), formerly AVMA's director of scientific activities, voiced concern that the fellowship program would falter unless a means were found to provide a continued income for it. He applauded the efforts of the Women's Auxiliary but added that adequate financial support of the program is a responsibility of the members of the profession.

"The action of the Chicago V.M.A. will inspire local and state associations across the country to establish similar programs of support," he said.

Divisional chairman who will be responsible for the drive in their particular area of the city are: Drs. Warren Anderson (ILL '56), Myron Bernstein (MID '44), Norris E. Booth (OSU '54), Olaf N. Christensen (OSU '32), Mark Davenport (OSU '51), John Hanover (OSU '46), Robert Keough (ILL '55), Bernard Meyerowitz (UP '36), Grant Misener (ONT '38), Jacques Neff (MSU '44), Ed Saunders (OSU '43), Robert Storm (ISU '40), president, Chicago V.M.A., Joseph Wheatley (KSU '54), Jack R. Dinsmore (OSU '41), and Frank Gentile (ISU '42).

AVMA Gives 1961 Science Youth Awards

The 1961 AVMA Science Youth Awards were presented to Charles Theodore Womack, III, 17, Greenwood, Miss., and Sandra Hager, 17, Milwaukee, Wis.

The awards were presented at the Health Awards Banquet, National Science Fair, International, in Kansas City, Mo., May 11, 1961. The 2 winners were chosen from 385 finalists at the fair.

Charles Womack, who received the award and an invitation to exhibit at AVMA's annual session in Detroit, Mich., Aug. 20-24, 1961, prepared his exhibit on "Effects of Splenic Extracts on Sarcoma in 2 Animal Species." His project portrayed the treatment of cancer of the connective tissue in chickens and mice with extract prepared from a calf's spleen. The cancer was arrested in 30 purebred mice, but the lives of chickens were lengthened by only a few days. Dr. Robert E. Arline (AUB '49), Greenwood, Miss., supervised Charles' experiments to assure the comfort and humane treatment of the experimental animals.

The alternate winner, Sandra Hager, received the award for her exhibit "Cancer Chemotherapy." Her project illustrated the effects of 2 chemicals, hydrogen peroxide and cobaltocene, on leukemia in mice. After producing leukemia in mice and administering the chemicals, she demonstrated that hydrogen peroxide treatment is unsatisfactory, whereas cobaltocene seems to have definite possibilities as a leukemia-inhibiting agent.

Presentations of the awards were made by Dr. G. T. Edds (TEX '36), AVMA Council on Research, who also served as chairman of the AVMA's board of judges. Judges were Drs. Charles R. Smith (OSU '44), AVMA Council on Research, and E. E. Leasure (KSU '23), AVMA president.

In presenting the awards Dr. Edds read the inscripitions: "The American Veterinary Medical Association Science Youth Award is presented to Charles Theodore Womack,

The AVMA Board of Judges is shown with the Science Youth Award winners following the ceremony. They are (left to right): Dr. E. E. Leasure, Sandra Hager, Dr. G. T. Edds, Charles Womack, and Dr. C. R. Smith.

Dr. E. E. Leasure, AVMA president, is shown with the AVMA Science Youth Award winners for 1961. They are Sandra Hager, Milwaukee, Wis., and Charles T. Womack, III, Greenwood, Miss.

III, in recognition of a highly commendable and original exhibit in the biological sciences applicable to the value and health of animals. 1961 National Science Fair—Kansas City, Missouri, May 10-13. Signed: G. T. Edds, D.V.M., Judging Committee, and Elden E. Leasure, D.V.M., President."

Sandra Hager, who received a similar citation, will take the winner's place should he not be able to attend the AVMA annual session in Detroit.

Presentations of other health awards were made at the Health Awards Banquet on behalf of the American Pharmaceutical Association, the American Medical Association, and the American Dental Association.

Dr. E. E. Leasure served as master of ceremonies at the banquet.

Point Credit For Reserve Officers Attending AVMA Convention

Veterinarians holding Reserve commissions in the Air Force Veterinary Corps and the Army Veterinary Corps, who are not on active duty, may receive reserve credit for attending the AVMA convention in Detroit. This arrangement has been approved by the Chief of Staff, Headquarters, U.S. Air Force, and the Commanding General, U.S. Continental Army Command.

Such reserve officers of the Air Force and Army are eligible to earn training and retirement point credits provided such attendance at any session of the convention is for a period of not less than 2 hours and that the officer registers for each day he attends the Convention. Not more than one credit can be granted for any single calendar day. Provisions will be made for enrollment near the convention registration desk. At time of enrollment for the reserve credit, appropriate instructions will be provided the reserve officer concerned.

Dr. G. A. Young Honored for SPF Work

Dr. George A. Young (COR '43), chairman of the Department of Veterinary Science, University of Nebraska, was awarded the 5th annual Distinguished Service Research Award of the Animal Health Institute.

Dr. Young received a bronze plaque and a check for $1,000 from the institute. He was honored for his work in the development of

the specific pathogen-free swine program.

The award is presented to "publicly proclaim American agriculture's debt of gratitude to scientists in the field of animal health and nutrition and to honor a member of the scientific fraternity who has particularly distinguished himself in this area of service within the current 5-year period."

Commencements

Graduating Class, 1961, School of Veterinary Medicine, University of Georgia

Top row (left to right)—L. M. Blanken, C. B. Morley, N. A. Williams, S. T. Watson, W. T. Smith, E. C. Anderson, R. H. Durham, R J. Orrell, D. D. Blanchard, Jr., T. R. Ridgeway, C. R. Egelston.

Second row—D. J. Steinbauer, V. C. Lovell, J. L. Smalley, Jr., C. R. Tyree, W. M. Martin, W. C. Driggers, J. S Starr, III, J D. Howell.

Third row—A. L. Turk, G. H. Frank, M. S. Nix, Jr., R. D. King, H. C. Bloodworth, J. S. Jackson,

Fourth row—V. C. McKaughan, G. L. Williams, Jr., J. B. Johnson, J. V. Risser, J. H. Howard, Jr., J. D. Clark, J. I. Moulthrop, E. L. Roberson, J. W. Eubanks.

Fifth row—J. N. Dalton, W. C. Davis, W. D. Miller, T. K. Miller, C. W. Edmonds, J. R. Pick, F. W. Sigler, W. J. Scott, V. E. Misner, W. A. Weaver, W. M. Sims, Jr.

Sixth row—W. C. Cottingham, B. N. Weeks, J. E. Strickland, D. B. Arnold, W. D. Fletcher, P. Wait, R. A. Cecil, W. L. McGee, Jr., D. E. Ellis, J. D. Peeples, J. J. Martin.

University of Georgia

At the 1961 commencement exercises of the School of Veterinary Medicine at the University of Georgia, the following 56 candidates were presented the D.V.M. degree:

Edwin C. Anderson
David Beall Arnold
D. D. Blanchard, Jr.
Lawrence Marvin Blanken
Howard C. Bloodworth
Richard Alan Cecil
James Derrell Clark
Walter C. Cottingham
John N. Dalton
William C. Davis
William C. Driggers
Robert H. Durham
Charles R. Egelston
Donald E. Ellis
James W. Eubanks
W. David Fletcher
Glynn H. Frank
James H. Howard, Jr.
Joe D. Howell
Joel S. Jackson
Jerome B. Johnson
Ralph D. King
V. C. Lovell
James J. Martin
William Martin
Wayne L. McGee, Jr.
Van C. McKaughan
Teresa Koebler Miller
William D. Miller
Vilas Eugene Misner
Charles Bruce Morley
James I. Moulthrop
Marvin S. Nix, Jr.
Robert Jerome Orrell
James David Peeples
James R. Pick, Jr.
Theodore R. Ridgeway
John V. Risser
Edward Lee Roberson
William J. Scott
Fred W. Sigler
William M. Sims, Jr.
James Luther Smalley, Jr.
William Ted Smith
Julian S. Starr
David J. Steinbauer
James E. Strickland
Arthur L. Turk, Jr.
Ruth Tyree
Pierre Wait
Samuel Thomas Watson
William Amzi Weaver
Billy Nance Weeks
George Lawton Williams
Neil A. Williams

Graduating Class, 1961, College of Veterinary Medicine, University of Illinois

Top row (left to right)—Calvin W. Barthel, Joseph L. Brewer, Lawrence Friedman, J. Kendell Harding, Marjorie B. Losch, Robert L. Kinser, C. Max Lang, Robert S. Hirth, Carl T. Armstrong. Second row—Richard P. Bradbury, Kenneth L. Wronke, David B. Mackay, Wesley D. Knutson. Third row—David L. Huxsoll, Albert J. Day, Philip I. Rose, J. Wayne Rehn, Joseph A. Duce, Robert E. Hampton.

Fourth row—Lee F. Patel, Joseph Szanto, Fred H. Olin, Louis E. Landau, Dean C. A. Brandly, Ellis E. Seavoy, Louis E. Strack, Freddie L. Uhland, M. Allen Cosnow.
Fifth row—Gerald H. Hankes, Lawrence J. Roder, William R. Losch, John W. Horn, Donald B. Feldman, Edward J. Dick, Noel D. Lehner, Kenneth E. Kopecky, Lester G. Thomson.

University of Illinois

The College of Veterinary Medicine, University of Illinois, presented 36 D.V.M. degrees at the 1961 commencement exercises. They were awarded to:

Carl T. Armstrong, Jr.
Calvin William Barthel
Richard P. Bradbury
Joseph Leo Brewer
Marvin Allen Cosnow
Albert J. Day
Edward John Dick
Joseph Anthony Duce
Donald Burton Feldman
Lawrence Friedman
Robert Eugene Hampton
Gerald Herman Hankes
John Kendell Harding
Robert Stephen Hirth
John William Horn
David Leslie Huxsoll
Robert Lynn Kinser
Wesley Dale Knutson
Kenneth Edward Kopecky
Louis Ernst Landau
Carol Max Land
Noel Davis Lehner
Marjorie Braun Losch
William Reel Losch
David Bard Mackay
Fred Harry Olin
Lee Frank Patel
John Wayne Rehn
Lawrence Joseph Roder
Philip Quenten Rose
Ellis Earl Seavey
Louis Edward Strack
Joseph Szanto
Lester Garland Thomson
Freddie LeRoy Uhland
Kenneth Louis Wronke

Graduating Class, 1961, School of Veterinary Medicine, University of Montreal

Left side of picture (top to bottom)—Mgr. Irenee Lussier, Recteur, Dr. J. Dufresne, Director; Dr. E. Jacques, assistant director; Dr. L. Cournoyer, director of studies; Abbot I. Bescoteaux, Chaplin.

Top row—Arthur Forest, Jacques Desrosier, Louis Bernard, Roland Gagon, Louis Rolland, P. Emile Vincent, Gilles Rivard.

Second row—Emile Fouarge, Guy Huneault, Hubert Favre, Denis Dragon, Jean-Marc Bedard, Jerome Girard, Francois Lamoureux, Benjamin Simard.

University of Montreal

At the 1961 commencement exercises of the School of Veterinary Medicine at the University of Montreal, St. Hyacinthe, Que., 15 candidates were presented the D.V.M. degree. They were:

Jean-Marc Bedard
Louis Bernard
Jacques Desrosier
Denis Dragon
Hubert Favre
Arthur Forest
Emile Fouarage
Roland Gagnon
Jerome Girard
Guy Huneault
Francois Lamoureux
Gilles Rivard
Louis Rolland
Benjamin Simard
Paul-Emile Vincent

Charles R. Becker
Auburn University

Joseph O. D. Slocombe
Ontario Veterinary College

Joseph E. Smith
Texas A. & M. College

John M. Weinmann
Colorado State University

Women's Auxiliary

Auxiliary Presents Annual Awards

Twenty young men, all of them chosen for outstanding contributions to the advancement of the veterinary profession on their campuses, were awarded certificates and checks for $50 by the Women's Auxiliary to the AVMA recently.

Without exception, these men were eminent in many phases of college activities. But even more indicative of their true abilities is the way some of them were able not only to overcome adverse circumstances in obtaining their degrees in veterinary medicine, but also to achieve the distinctions of being chosen their classes' most illustrious graduates. Service in the armed forces interrupted the college training of 5 of the men.

Wallace Fredericks Glidden, III, of the University of California, financed his education at California State Polytechnic College by working in the livestock management of the Animal Husbandry Department. He has served in the U.S. Army Veterinary Corps.

John M. Weinmann, one of the Colorado State's co-recipients, was selected by his school for his "enviable scholastic achievements." He had served as a veterinary technician in the U. S. Air Force.

Lot D. Smith, Colorado State's other recipient, spent 2 years as a missionary in South America before he enrolled at Colorado State. Both of the Colorado co-recipients received a certificate and a check for $25.

The college career of the University of Illinois recipient, David Bard Mackay, was interrupted in 1958 by an extended illness. Undaunted, he enrolled in the University of Hawaii on a part-time basis and while there sang with a Lutheran church choir and a men's glee club. When he returned to the University of Illinois, he waited on tables at several fraternity and sorority houses to help defray his expenses.

David B. Mackay
University of Illinois

Wallace F. Glidden, III
University of California

Carlos H. Miranda
Tuskegee Institute

Lot D. Smith
Colorado State University

Robert S. Miller
Washington State University

Donald W. Luchsinger
University of Minnesota

Philip N. Perrel
Ohio State University

Gerald A. Kelso
Iowa State University

Port-of-Spain, Trinidad, produced Joseph Owen Douglas Slocombe, Ontario's Auxiliary Award recipient. Mr. Slocombe, chosen by classmates, has also received a prize from the Women's Auxiliary to the Canadian V.M.A. Tuskegee Institute's most outstanding graduate, Carlos H. Miranda, is a native of Villalba, Puerto Rico. He, in the opinion of his classmates, "has done the most to foster improved inter-social understanding of the role of veterinary medicine in our society and on our campus."

Louis Rolland, Quebec's most outstanding graduate, organized the École de Médecine Vétérinaire's first open house in January, 1960, and the second one in 1961. Mr. Rolland, who is married, plans to continue his education with postgraduate work.

William Edwin Michel of the University of Missouri has been active as a member of the AVMA Student Chapter public relations committee, which planned and staged open house activities of the school. Mr. Michel served as a second lieutenant in the field artillery.

Anthony C. Thomas from Oklahoma State and Barry Melvyn Torine of Michigan State are also Army veterans. Mr. Thomas was a captain in the infantry, and Mr. Torine served 33 months in the Army. Mr. Torine was cited for his work in the Veterinary Student Glee Club. Mr. Thomas' most important extracurricular activity was as a member of Oklahoma's Student Senate.

Native Iowan Gerald A. Kelso has served 2 years as the College of Veterinary Medicine's representative to Cardinal Guild, the student governing body of Iowa State University. He is also a member of Iowa State's highest honorary society for men, the Cardinal Key.

Also active in student governing bodies was Charles Richard Becker from Auburn University. He served as his school's representative to the Southern Universities Student Association at Hattiesburg, Miss. Donald Wayne Luchsinger of the University of Minnesota was a member of his school's Student Center Board of Governors both in 1959 and 1960.

Cited for journalistic activities were Texas A.&M.'s Joseph E. Smith, who served as editor of the *Southwestern Veterinarian*; and Washington State's Robert Skrym Miller, who has been employed for the past year as farm editor of radio station KWSC.

William Amzi Weaver from the University of Georgia has been active in the Radio Guild. Mr. Weaver is married and the father of 2 children.

Ohio State's *Speculum* has been edited this past year by Philip Neil Perrel, the recipient of the award there.

William E. Michel
University of Missouri

Anthony C. Thomas
Oklahoma State University

Barry M. Torine
Michigan State University

William A. Weaver
University of Georgia

Louis Rolland
Quebec Veterinary College

Joe Kashner
Kansas State University

George B. Salzmann
Cornell University

Peter Theran
University of Pennsylvania

Class presidents who received Auxiliary Awards were Peter Theran of the University of Pennsylvania and Joe Kashner from Kansas State University. George Bernard Salzmann of Cornell was chosen the Auxiliary's recipient at the school because of his activities as president of the Student Chapter of the AVMA.

s/Mrs. A. M. Simpson
Women's Auxiliary to the AVMA
Vice-President for Publications

Deaths

Star indicates member of AVMA

Dr. J. D. Grossman Dies

James D. Grossman (OSU '14) died May 24, in Istanbul, Turkey, while on an extensive tour of Europe and Asia. His death was due to brain and head injuries sustained in a fall.

Dr. Grossman was co-author of the textbook *Anatomy of the Domestic Animals.* It has been translated into many languages.

Dr. James D. Grossman

It is used extensively in both U.S. and foreign veterinary schools. From 1914 to 1919, he was head of the Department of Veterinary Anatomy, Iowa State College. He was chairman of the Department of Veterinary Anatomy at Ohio State University from 1919 until his retirement in 1954.

After his retirement in 1954 Dr. and Mrs. Grossman spent 2 years in India, where he assisted in the development of veterinary medical education. He was a past vice-president of the AVMA and became an AVMA life member in 1954. He was also a life member of the Ohio Veterinary Medical Association. Mrs. Grossman, who survives him, is a charter member, past-president, and past-historian of the Women's Auxiliary to the AVMA.

Lee J. O'Reilley (CVC '12), 71, Merrill, Wis., died April 22, 1961.

Dr. O'Reilley was president of the Wisconsin V.M.A. in 1918. He was interested in fur animal breeding and was active in fur animal breeders' organizations.

Warren H. Rich (CVC '16) Delafield, Wis., died of a heart attack April 6, 1961.

Ed Wyatt, 77, of Gorman, Texas, died May 13, 1961, after surgery.

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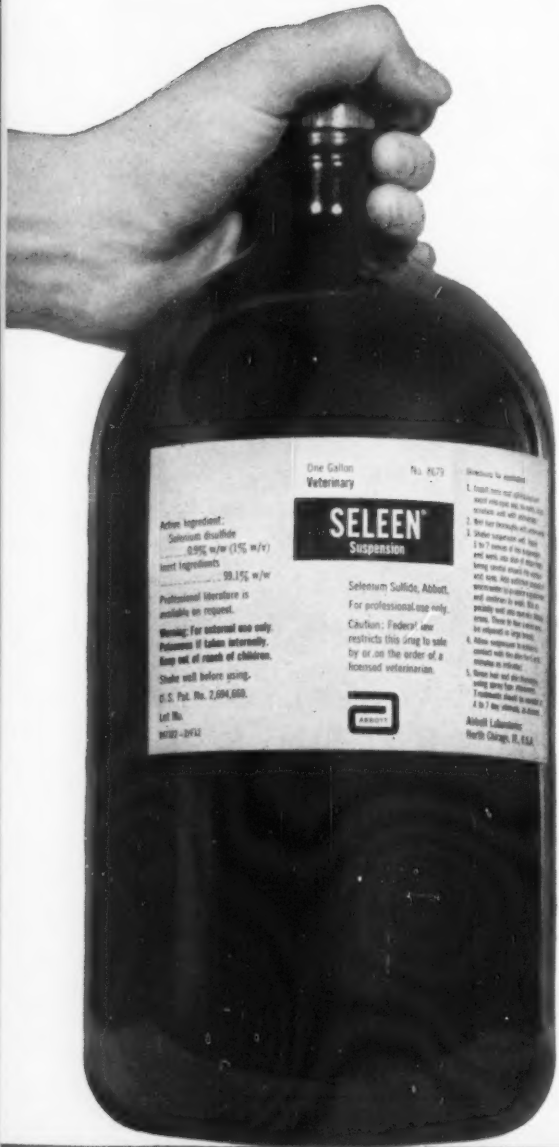
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*Dawson, H.A.; Lickfeldt, W.E., and Brengle, L.A.: J. Am. Vet. Med. Assoc. *135*:69 (July 1) 1959.

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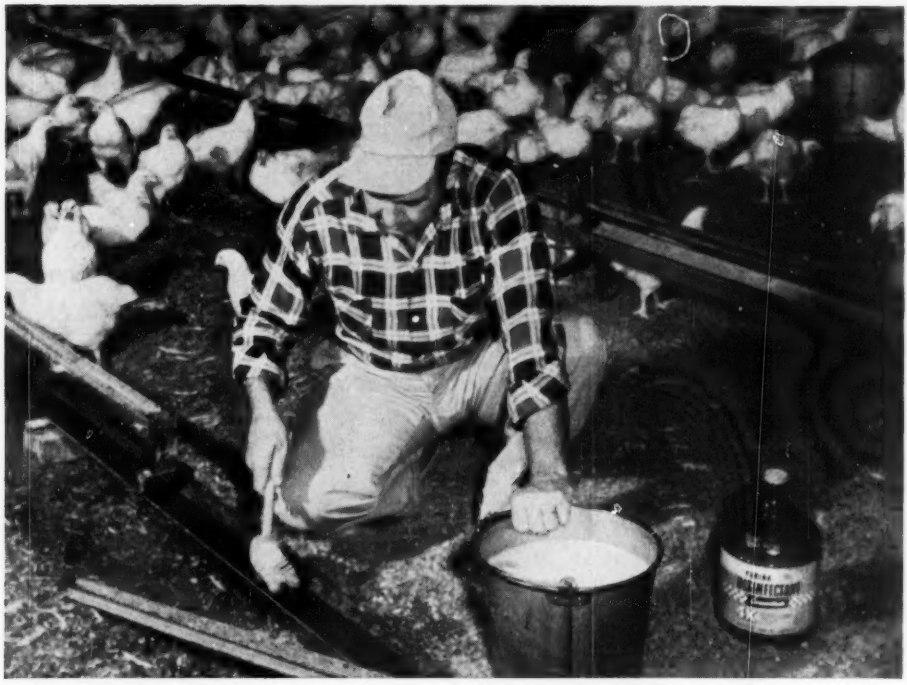

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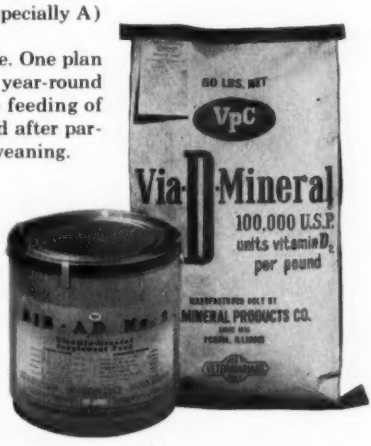

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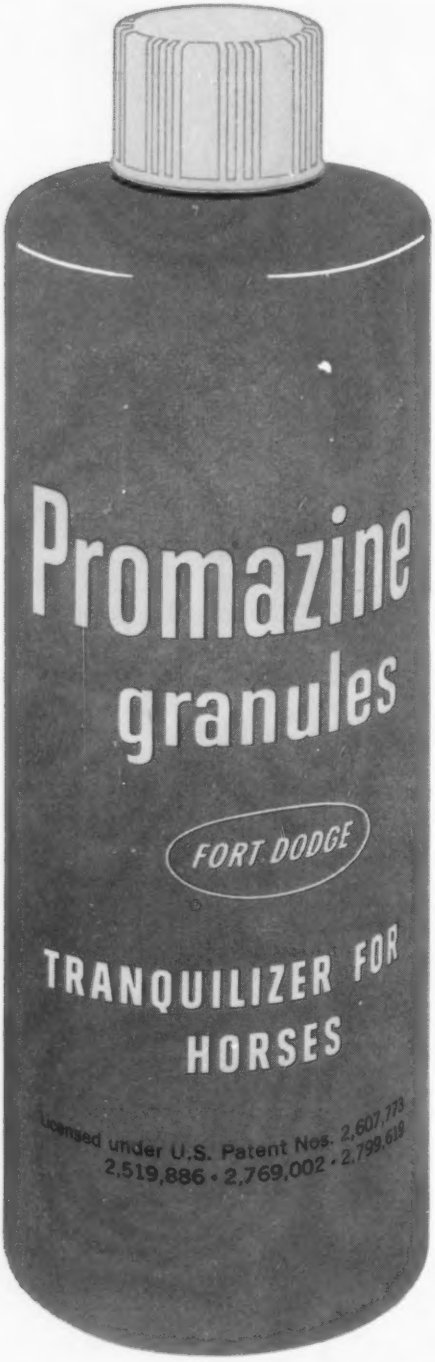

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references:

1. Raker, C. W., and English, B. *J.A.V.M.A.*, 134:23 (1959).
2. Stucki, B. *Western Vet.*, 5:15 (1958).
3. Stewes, A. R. *Mod. Vet. Prac.*, 40:45 (1959).
4. Brown, C. W. *ibid.*, 40:47 (1959).

Vol. 139

No. 2

July 15, 1961

Journal

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Diagnosis of Aortic Embolism by Aortography

Roy K. Imhoff, D.V.M., and Robert J. Tashjian, V.M.D.

AORTIC EMBOLISM in cats and dogs has long been recognized as a clinical entity in veterinary medicine. Its diagnosis in the living animal has depended on symptomatology. A method of aortography is described to aid diagnosis. A radiopaque contrast medium is introduced intracardially. The radiographs of the opacified aorta that are obtained subsequently may be diagnostic of aortic embolism.

In most of the veterinary literature, aortic embolism is called aortic "thrombosis." As mentioned in a previous publication,[10] the term "aortic thrombosis" is a misnomer when used to describe this condition. The original clot or thrombus usually forms in the left atrium or ventricle. Pieces of the thrombus are then dislodged and form blockages in the aorta or iliac arteries. The term "saddle embolus" is also applied to the condition.

Review of Literature

Aortic embolism in animals was 1st described in 1930[2] and, since then, has been reported several times.[4,7,10,11,13,18] The condition was brought to the attention of American practitioners in 1955 and clinical signs were thoroughly described.[10] Arterial embolism in 23 cats and dogs was attributed to acute vegetative endocarditis.[19] Aortic embolism in man was first reported in 1749.[18]

Aortography was used in man for the 1st time in 1929.[16] The translumbar approach was the preferred method and is still the most popular procedure. Other methods include: (1) countercurrent aortography[1] in which a hypodermic needle is inserted into the femoral artery and the contrast medium is injected retrograde, the amount of countercurrent filling being governed by the rate of injection; (2) retrograde aortography[6] in which a catheter is inserted into the femoral artery and passed up to the desired level in the aorta for injection; (3) translumbar aortic puncture and catheterization[3]; and (4) intravenous aortography.[20] Although the clinical use of aortography has not been described in the dog and cat, its application to experimental procedure is not uncommon.[5,12,14,15,17,21]

Method

If possible, food is withheld from animals for 24 hours and an enema is administered before aortography, since an empty intestinal tract permits clearer, more accurate aortograms. The animal is anesthetized with a short-acting anesthetic such as thiamylal sodium.* The left side of the chest is clipped and prepared as for surgical entry. The animal is then

Dr. Imhoff is attending veterinarian, Animal Medical Center, New York, N.Y.; Dr. Tashjian is head of Medical Service, Animal Medical Center, New York, N.Y., and research associate, Veterans Administration Hospital, Bronx, N.Y.

*Surital sodium, Parke Davis & Co., Detroit, Mich.

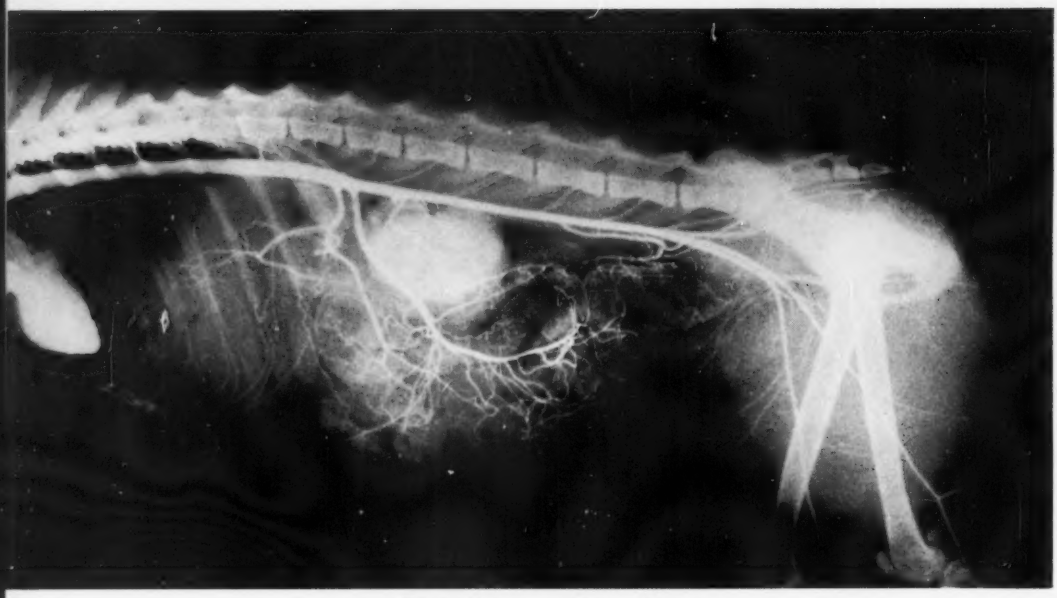

Fig. 1—Aortogram of normal cat.

placed in a right lateral position. The center of the x-ray beam is directed just ventral to the 3rd lumbar vertebra. A cardiac puncture method previously described is used.[8] An 18-gauge, 2½-inch needle attached to an empty 2-cc. syringe is introduced into the 8th intercostal space at the junction of the upper 2/3 and lower 1/3 of the chest. The needle is directed anteriorly and laterally until the throbbing heart is felt against the end of the needle. The needle is thrust quickly into the left ventricle. When the left ventricle is entered, bright red blood should be forcefully ejected into the syringe. If the blood is dark in color or flows slowly from the needle, the right ventricle has probably been entered and a renewed attempt should be made to enter the left ventricle.

After the left ventricle is entered, the 2-cc. syringe is replaced with a syringe filled with diatrizoate sodium (90%)** or a comparable circulatory contrast medium. The suggested dose is 1 cc./lb. of body weight. The radiopaque contrast medium is injected as rapidly as possible into the left ventricle and the needle is immediately withdrawn from the thorax. After a 1- to 3-second interval the radiograph is taken. This time sequence was established after taking rapid series aortograms at the rate of 2 radiographs per second. However, this procedure requires special radiographic equipment. By this technique, the radiopaque contrast medium reaches the terminal aorta in 1½ to 2 seconds.

**Hypaque 90, Winthrop Laboratories, New York, N.Y.

Results

Figures 1 and 2 are aortograms of normal cats; figure 3, of a normal dog.

Of the 25 normal cats in which a left ventricular puncture was performed, one died when the contrast medium was injected inadvertently into the pericardial sac. None of the other cats had ventricular damage on gross necropsy.

The vascular anatomy of the caudal aorta and pelvic limbs is shown (Fig. 2).

Aortograms of 2 cats and a dog, diagnostic of aortic embolism, are included (Fig. 4-6).

The radiopaque contrast medium does not reach the most proximal aspect of the embolus. There is a 2- to 3-cm. "dead space" between the end of the column of contrast medium and the proximal end of the embolus when the radiographic and necropsy findings are correlated. Presumably, this is due to a fairly constant resistant pressure just in front of the embolus.

Discussion

This method of aortography provides the necessary opacification of the aorta and

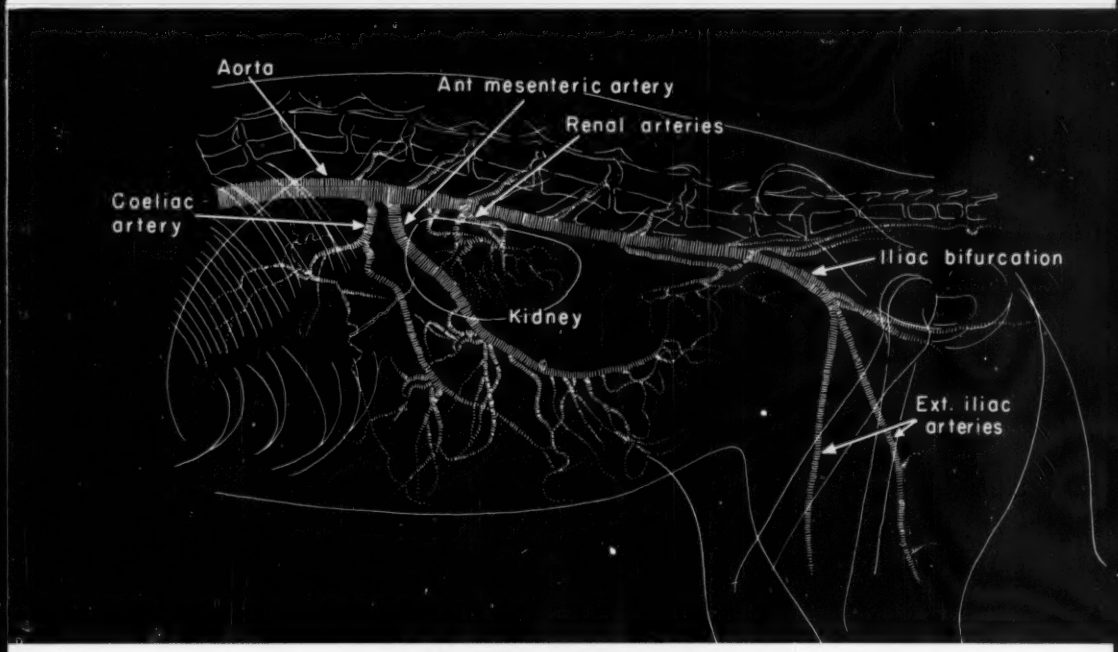

Fig. 2—Vascular anatomy of normal cat.

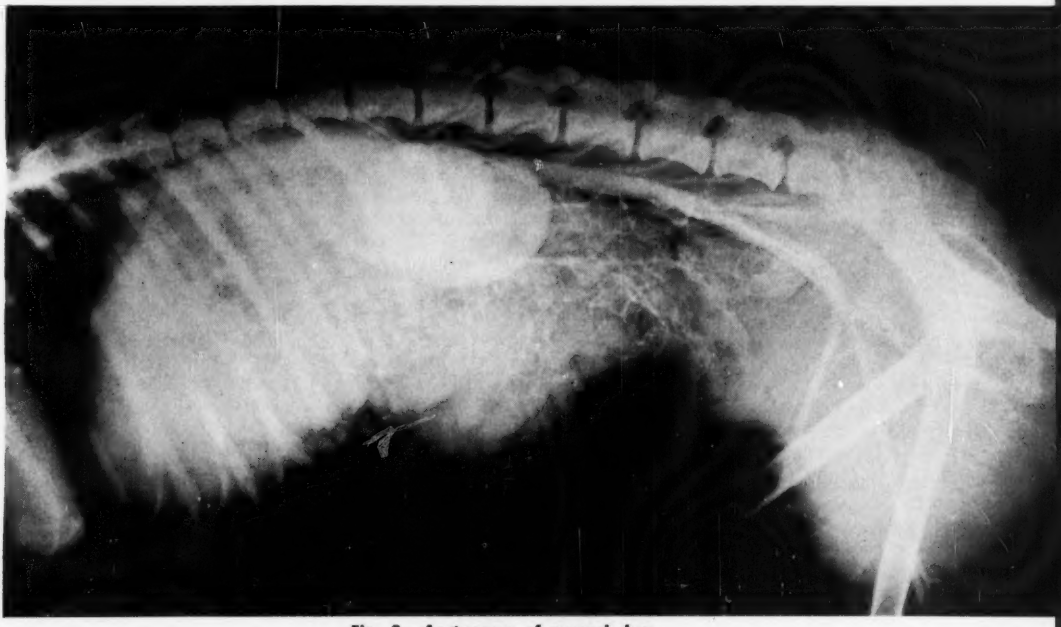

Fig. 3—Aortogram of normal dog.

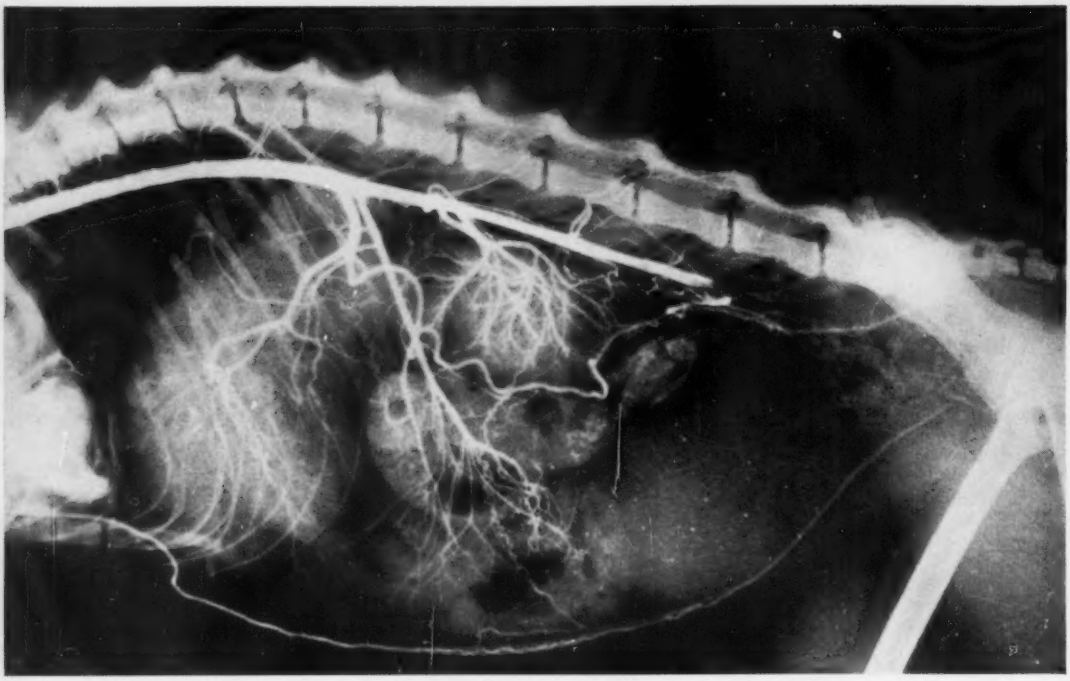

Fig. 4—Aortogram of a cat with a "saddle embolus." The embolus occluded the aorta at the iliac bifurcation and extended 1 cm. into each external iliac artery. The mammary artery is seen extending to the hindquarters of the cat indicating a possible collateral blood supply.

tributaries in cats and dogs. It eliminates the special equipment and techniques that are required for catheterization. An alternate technique, intravenous introduction of the radiopaque contrast medium, which is safe and easy to perform, does not satisfactorily opacify the posterior aorta.

Radiographs taken from the right lateral position are preferred for 2 reasons: (1) The superimposed vertebrae cause poor visualization of the aorta when the dorsoventral position is used, and (2) the left ventricle is more easily entered with the animal on its right side.

To perfect translumbar aortography for human use, dogs have been used.[9] Aortic puncture was considered unsafe because of hemorrhage from the puncture site. Several fatalities were reported due to this complication. This difficulty is rarely encountered in man due to a difference in vascular anatomy.

The left ventricular puncture technique for the introduction of radiopaque contrast medium must be used judiciously in cats and dogs affected with aortic embolism. There are several risks involved. The affected cat is frequently in a state of shock. Left ventricular lesions may be present.[19] The anesthesia necessary for the procedure is an added hazard. Cardiac tamponade may be produced. If aortic occlusion is present, a greater concentration of contrast medium reaches the brain, causing a relative ischemia in that organ.

Because of these dangers, aortography is best limited to animals for which a positive diagnosis cannot be made by clinical signs alone. For example, a cat with weakness of the hindlegs, intermittent claudication, and no loss of femoral pulse may have a saddle embolus, since the pulse wave is occasionally propagated through the clot. This cat would be a justifiable candidate for the procedure. Also, a cat lame in just one leg may have a blockage of one of the iliac arteries. In this case, a differential diagnosis must be made among aortic embolism, central nervous system damage, acute muscular soreness or weakness, fractures, metabolic bone diseases (e.g., osteogenesis imperfecta), bone neoplasm, and intervertebral disk herniation. In such cases aortography is a useful diagnostic tool. It is also a means of outlining the area of involvement for subsequent surgical excision of the embolus. When aortography is deemed advisable and the patients are carefully chosen, it can be a good clinical aid.

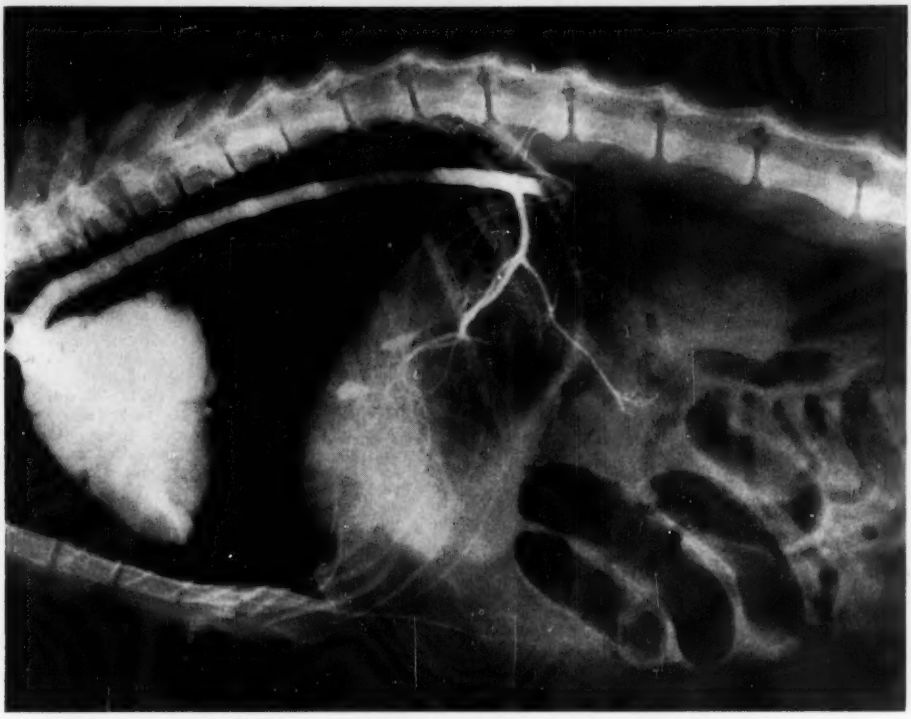

Fig. 5—Aortogram of a cat with a high aortic embolus. Two separate emboli were present. A proximal embolus 1½ cm. long occluded the aorta at the anterior mesenteric artery. The contrast medium stopped at this point. A 2nd embolus occluded the aorta at the iliac bifurcation and extended 3 cm. up the aorta.

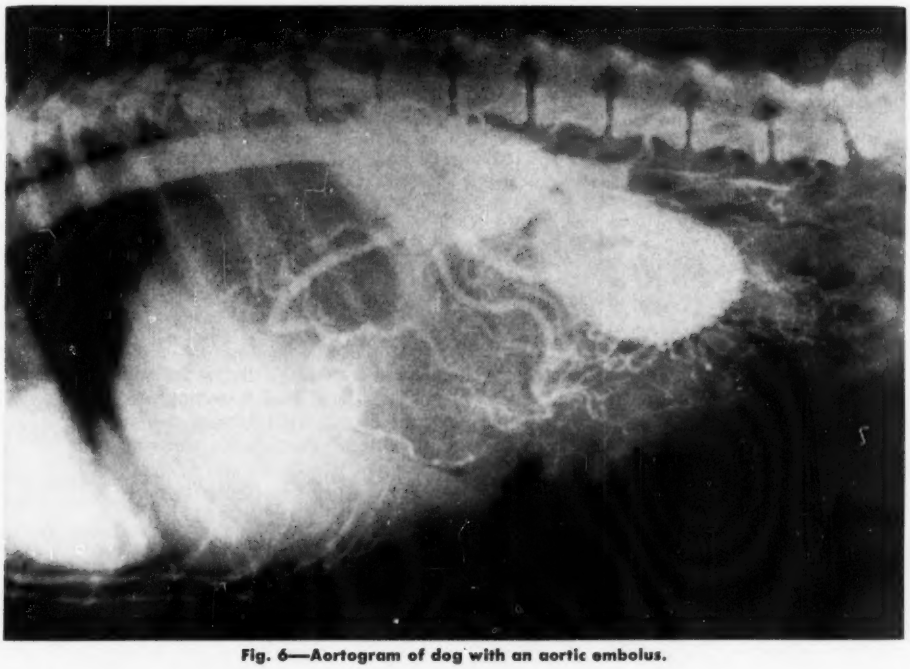

Fig. 6—Aortogram of dog with an aortic embolus.

Summary

A practical method of aortography for the diagnosis of aortic embolism in the dog and cat is described in which radiopaque contrast medium is given by intracardial administration.

The risks of this procedure are that the animal may be in a state of shock; left ventricular pathologic changes may be present; anesthesia may be an added risk; cardiac tamponade may be produced; and the contrast medium may have side effects.

The main clinical use is in differentiating aortic embolism from other causes of hindleg lameness and paralysis.

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Treatment of Osteosarcoma in the Dog

Two dogs with osteosarcomas were treated with triethylene thiophosphoramide. One dog given the drug had a temporary regression of the tumor mass. A 2nd dog, with bilateral osteosarcomas of the radii, was treated by intra-arterial injections of the drug and by limb perfusion, using nitrogen mustard in an extracorporeal artificial circulation apparatus. The tumor growth was arrested significantly.—*Res. Vet. Sci., 2, (April, 1961): 117.*

Radiographic Anatomy of the Cervical Region of the Canine Vertebral Column Part I. Fully Developed Vertebrae

W. C. D. Hare, Ph.D., D.V.M.&S., M.R.C.V.S.

RADIOGRAPHY of the cervical region of the vertebral column may be indicated when fractures, dislocations, or pathologic changes in the vertebrae or in the intervertebral disks are suspected. The radiographic image of the vertebral column is often confusing, so the purpose of this paper is to clarify some of the anatomical features by means of labelled drawings of radiographs. Reference is also made to certain anatomical features which should be taken into consideration when this region of the vertebral column is being radiographed.

The cervical part of the vertebral column is composed of 7 vertebrae. The 3rd, 4th, and 5th vertebrae closely resemble each other and are known as the typical cervical vertebrae. The 6th and 7th vertebrae retain many of the characteristic features of the typical vertebrae, but each has certain distinguishing features. The 1st and 2nd vertebrae, the atlas and the axis, are definitely atypical because they have been greatly modified for the special functions that they perform.

The atlas has a pair of large wings, or alae, which provide extensive areas for the attachment of a number of the muscles that act over the ginglymus atlanto-occipital articulation and, with the spinous process of the axis, for the attachment of the muscles that act over the trochoid atlanto-axial articulation. Cranially, the atlas has a pair of deep, cotyloid cavities for articulation with the condyles of the skull and, caudally, a pair of flattened, saddle-shaped areas for articulation with the cranial articular surfaces of the axis (Fig. 1-4).

The dens of the axis articulates with the dorsal surface of the ventral arch of the atlas and forms the floor of the vertebral canal at this level (Fig. 1 and 2). Although the dens has 3 ligaments, 2 alar and 1 transverse, associated with it and separating it from the spinal cord, excessive ventral flexion of the atlanto-axial articulation can force the dens against the spinal cord. The spinous process of the axis has the ligamentum nuchae inserted into its caudal extremity.

At 1st sight, the cranial articular surfaces of the bodies of vertebrae 3 to 7 appear to be convex and the caudal articular surfaces of vertebrae 2 to 7 appear to be concave. But, as other workers have shown,[1,5,10] closer inspection reveals that both the cranial and the caudal (Fig. 13) surfaces have a depressed, conc entral area surrounded by a ringlik ex, marginal area. The difference is he convex, marginal area is larger ne cranial surface than it is in the caudal surface. These 2 areas can be identified radiographically (Fig. 5-12).

In the articulated vertebral column, the articular surfaces of the bodies of adjacent vertebrae are separated by an intervertebral disk, and the concave, central area of each articular surface is covered by hyaline cartilage. The anatomy of the intervertebral disk, the pathologic changes that can involve the disk, and the radiologic diagnosis of these changes have been well described in earlier reports;[2-11] it will suffice here to comment on 1 or 2 of the normal features. The normal intervertebral disk is

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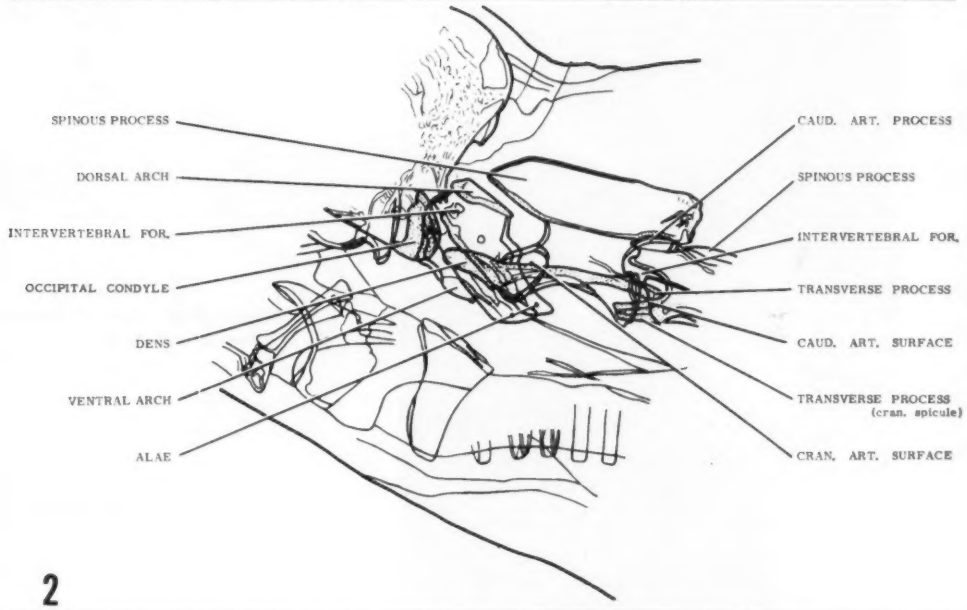
The author thanks Drs. J. E. Croshaw, Jr., and D. G. Lee, for their constructive criticism, and Mr. A. Marfaing, Wistar Institute, for the photographic work.

Fig. 1—Lateral view of the atlas and axis.

Fig. 2—Labelled tracing of Fig. 1.

Fig. 3—Ventrodorsal view of the atlas and axis.

Fig. 4—Labelled tracing of Figure 3.



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radiolucent with the result that a space, the intervertebral space, appears radiographically between the bodies of adjacent vertebrae (Fig. 5-12). Under normal circumstances, the width of an intervertebral space should be nearly the same as that of the spaces immediately cranial and caudal to it. Pathologic changes in the disk may result either in a reduction of the width of the space due to the degeneration and subsequent breakdown of the disk or in the appearance of an opaque area within the space due to calcification of the disk.

If either an intervertebral space or an intervertebral disk is to be studied radiographically, special care should be taken to

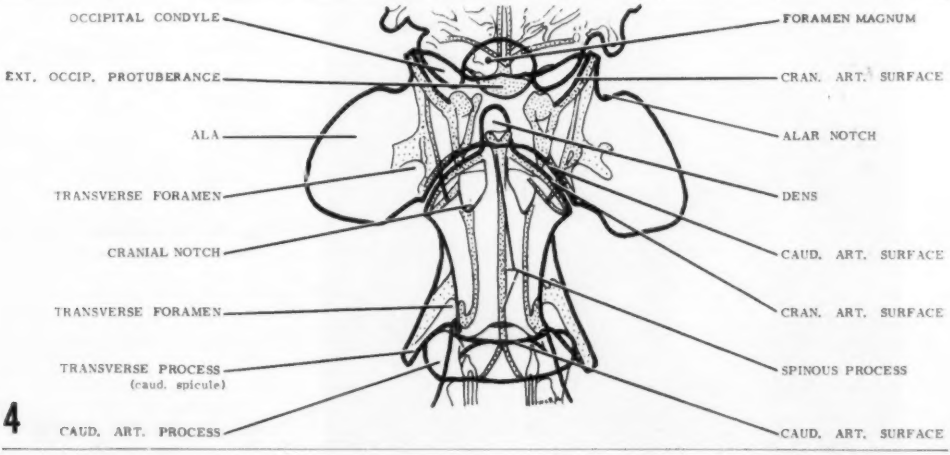

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Fig. 5—Ventrolateral view of cervical vertebrae 3 to 6.

Fig. 6—Labelled tracing of Figure 5.

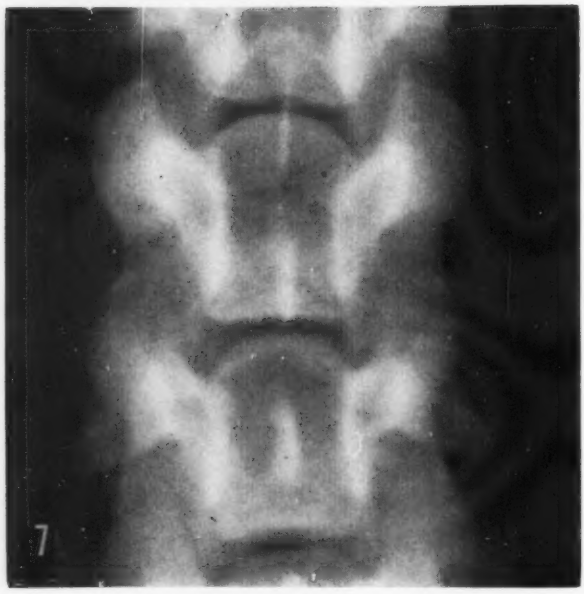
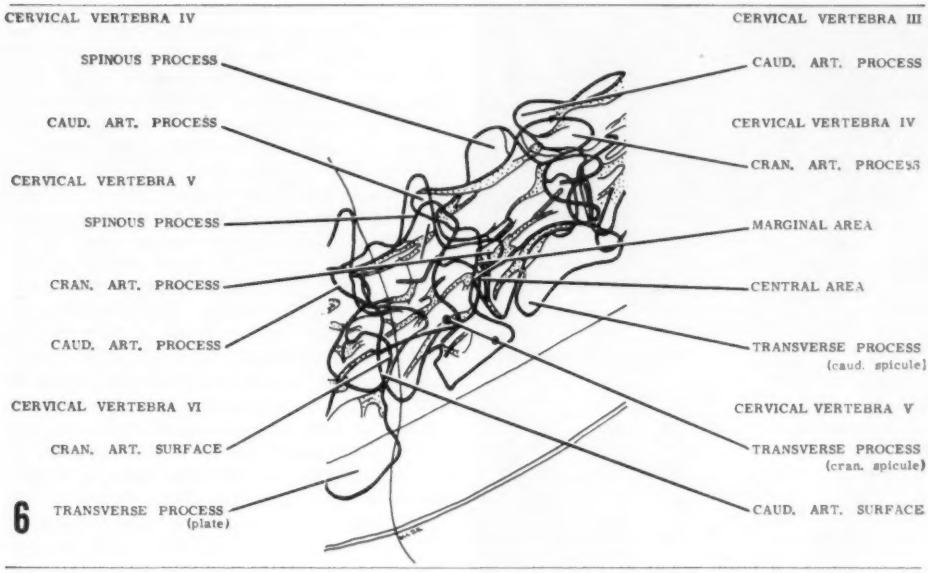


Fig. 7—Ventrodorsal view of cervical vetebrae 3 to 6.

Fig. 8—Labelled tracing of Figure 7.



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position both the x-ray tube and the animal so that the x-rays will pass parallel to the articular surfaces of the bodies of the vertebrae. The intervertebral space is narrow and deep and, therefore, the x-rays passing through the space can be likened to the rays of the sun shining into a narrow street flanked by tall buildings: just as it is only when the sun is directly overhead and its rays are passing parallel to the walls of the buildings that shadows are not cast by the buildings, so it is only when the x-rays are passing parallel to the plane of the articular surfaces of the bodies of the vertebrae that a true image of the intervertebral space is obtained. It is for this reason that, even with a focal-film distance of 36 inches, in an average-size dog only 3 or 4 intervertebral spaces can be studied properly in any one film.

If the animal is being positioned for a ventrodorsal view of the cervical region of the vertebral column, it should be remembered that the planes of the articular surfaces of the bodies of the cervical vertebrae, with the exception of those of the modified

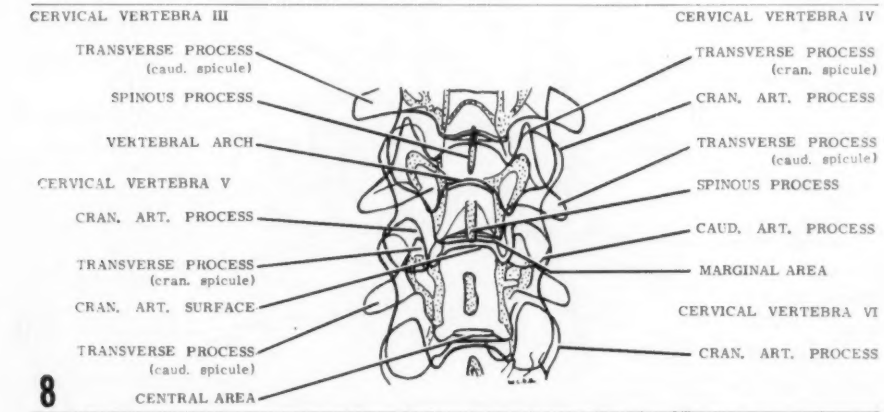

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Fig. 9—Lateral view of cervical vetebrae 5 to 7 and of thoracic vetebrae 1.

atlas and cranial extremity of the axis, are oblique to the longitudinal axes of the bodies rather than at right angles as they are in the other regions of the column (Fig. 1, 2, 5, 6, 9, and 10). The degree of obliquity is the greatest at the 7th vertebra and decreases toward the 2nd. It is such that the planes through the intervertebral spaces are nearly at right angles to the ground with the animal standing the normal, erect, attentive position. This means that, in an animal laid flat on its back for a ventrodorsal view, the planes through the intervertebral spaces between the cervical vertebrae will not be at right angles to the ground (x-ray film). Consequently, if the x-rays are to pass parallel to the planes of the articular surfaces and give a true image of the intervertebral space, either the x-ray tube must be tilted accordingly or the shoulders of the dog must be raised to allow the neck to assume the normal erect position in relation to the trunk.

Care should also be taken when an animal is being positioned for a lateral view of the cervical part of the column. The transverse diameter of the thorax is usually greater than that of the head. Consequently, unless the head is elevated from the table when the animal is laid on its side, the neck will be flexed slightly laterally. The resulting lateral flexion of an intervertebral articulation will bring about an apparent reduction in the width of that

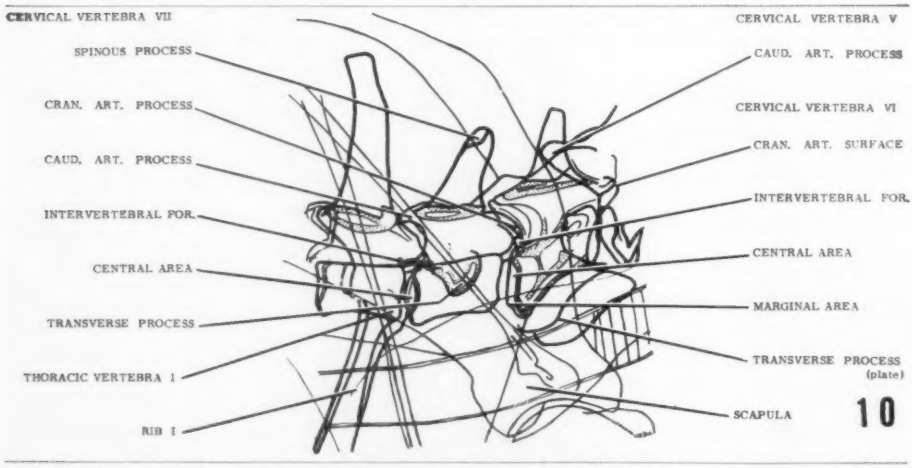

Fig. 10—Labelled tracing of Figure 9.

intervertebral space radiographically, due to the images thrown by the margins of the articular surfaces.

In a lateral view, the areas of decreased density, which are situated dorsal to the intervertebral spaces and are flanked by the cranial and caudal notches of the vertebral arches, represent the intervertebral foramina through which the spinal nerves and blood vessels pass (Fig. 1, 2, 9, and 10).

The facets on the articular processes of the cervical vertebrae lie nearly in a frontal plane with the cranial pair facing dorsally and slightly medially and the caudal pair facing ventrally and slightly laterally. In the ventrodorsal view of the articulated vertebrae (Fig. 7 and 8), the caudal pair of facets lies medial to the cranial pair.

In the typical cervical vertebrae, the transverse processes are in the form of 2 spicules which project from the arch, one craniolaterally and the other caudolaterally, with the latter the more dorsal of the 2 (Fig. 5-8 and 13 B and C). In the axis, each transverse process is in the form of a single spicule which projects caudolaterally (Fig. 1-4). In the 6th vertebra, each transverse process is modified and forms both a broad plate projecting ventrolateral-

Fig. 11—Ventrodorsal view of cervical vertebrae 5 to 7 and of thoracic vertebrae 1.

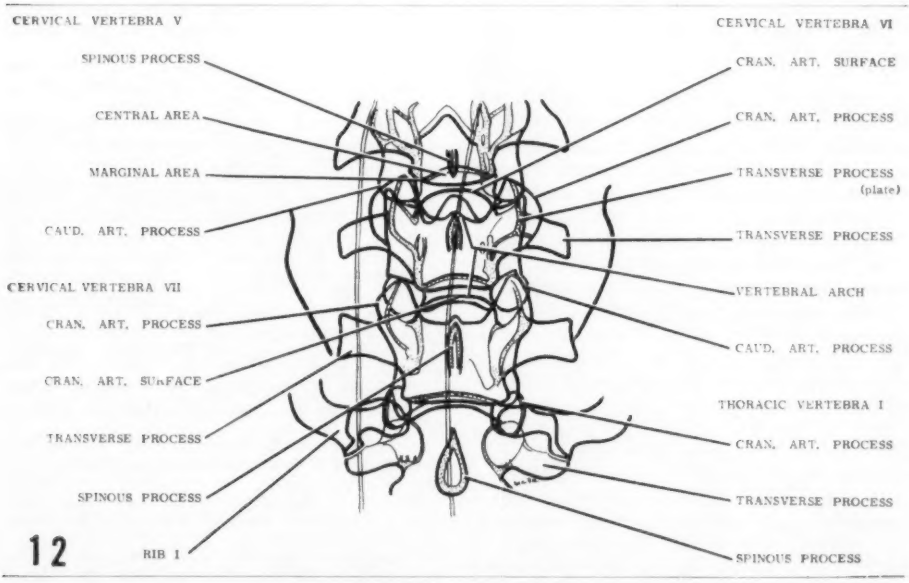

Fig. 12—Labelled tracing of Figure 11.

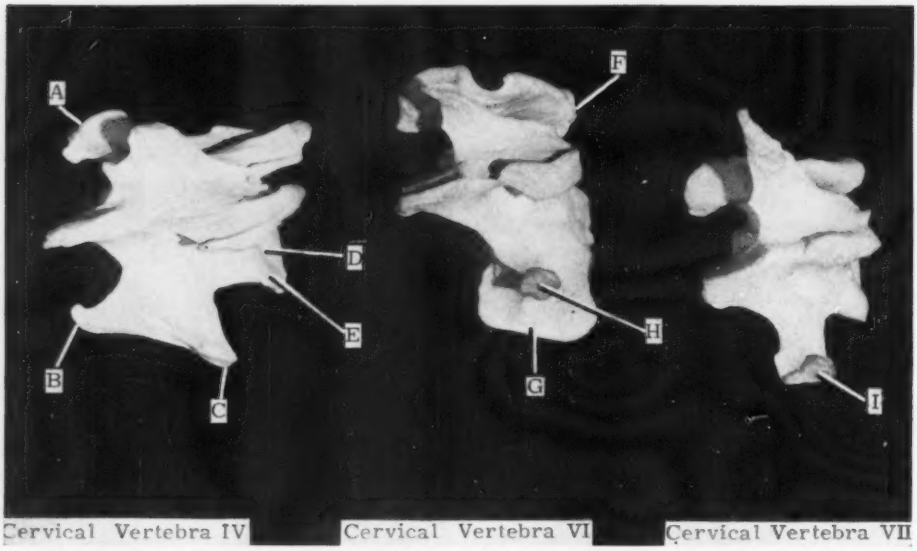

Fig. 13—Dorsolateral view of cervical vertebrae 4, 6, and 7. A—cranial articular process; B—transverse process (cranial spicule); C—transverse process (caudal spicule); D—central area, caudal articular surface; E—marginal area, caudal articular surface; F—caudal articular process; G—transverse process (ventral plate); H—transverse process (lateral process); and I—transverse process.

ly below the level of the body of the vertebra and a short blunt process projecting laterally from the arch (Fig. 9-12 and 13 G and H). In the 7th vertebra, each transverse process is in the form of a single blunt process which projects laterally from the arch (Fig. 11, 12, and 13 I). If cervical ribs develop, they articulate with the transverse process of this vertebra. Piercing the roots of the transverse processes of all the vertebrae except the 7th, there is a foramen, the transverse foramen, through which the vetebral artery and vein pass (Fig. 3 and 4).

Although all normal cervical vertebrae with the same serial number appear at a glance to be similar, a closer inspection reveals that minor morphologic differences between them do occur. These may show up radiographically. For example: in the atlas, the outline of the wings and the sizes of the various notches and foramina may vary; in the axis, the cranial extremity of the spinous process usually appears to be tapered on a lateral view and points craniad, but occasionally it is hooked, like a parrot's beak, and points cranioventrad; and, in the 3rd to the 7th vertebrae, the lengths of the dorsal or of the ventral spines may vary.

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Radiographic Anatomy of the Cervical Region of the Canine Vertebral Column Part II. Developing Vertebrae

W. C. D. Hare, Ph.D., D.V.M.&S., M.R.C.V.S.

IN THIS REPORT, the postnatal development of the cervical vertebrae is described briefly and illustrated radiographically.

Material

The dates given for the ossification process are based on a study of radiographs and skeletal material. The radiographic study was carried out mainly on dogs of 4 breeds: German Shepherd Dog, Collie, Beagle, and Bulldog. These dogs were radiographed at intervals starting at birth. Details have been given in an earlier report.[1]

The skeletal study was made on material taken from a total of 17 dogs of various breeds and of known age between the ages of 3 and 13½ months.

Positioning and Technique

Prior to being radiographed, the dogs were anesthetized with a barbiturate. Ventrodorsal and lateral exposures were made at each examination.

Ossification Process

The atlas has 3 centers of ossification well developed at birth, one for each of the lateral masses and one for the ventral arch (Fig. 1 A and D). During the development of the bone, the centers for the lateral masses come together in the mid-dorsal line and eventually unite during the 4th month of life to form the dorsal arch (Fig. 4). They also unite with the center for the ventral arch during the 4th month.

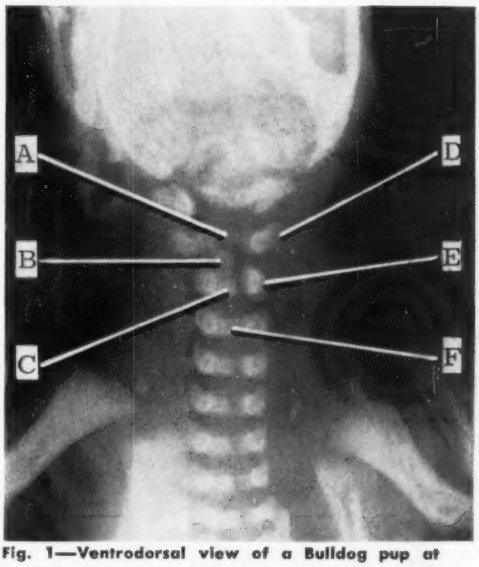

Fig. 1—Ventrodorsal view of a Bulldog pup at birth. A—center for the ventral arch of the atlas; B—center for the dens of the axis; C—center for the body of the axis; D—center for the lateral mass of the atlas; E—lateral center for the arch of the axis; and F—center for the main part of the body of cervical vertebrae 3.

The axis has 4 centers of ossification which are well developed at birth and 2 or 3 which develop after birth. The centers present at birth are the center for the main

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The author thanks Drs. J. E. Croshaw, Jr., and D. G. Lee, for their constructive criticism, and Mr. A. Marfaing, Wistar Institute, for his photographic work.

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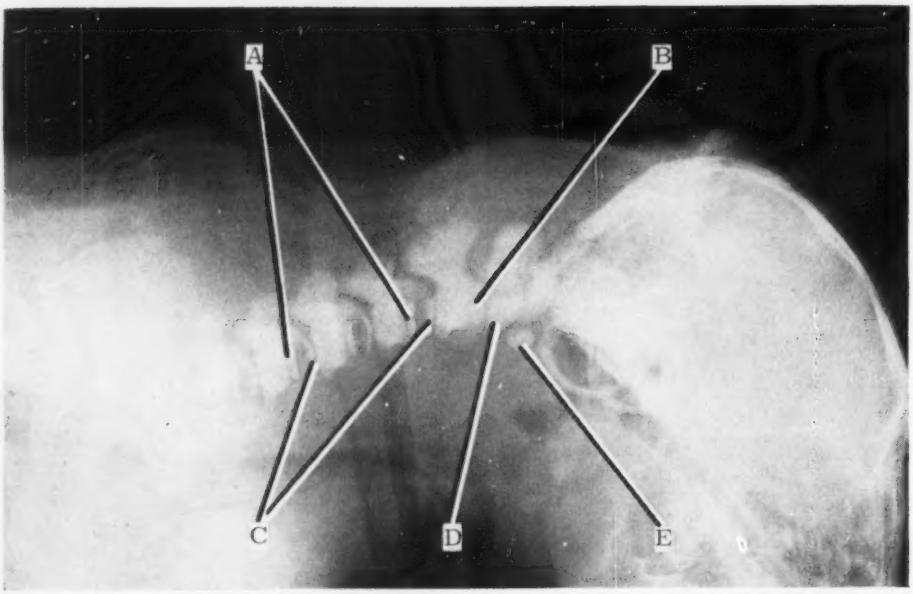


Fig. 2—Lateral view of a 21-day-old Collie pup. A—cranial epiphyses; B—cranial epiphysis of the axis; C—caudal epiphyses; D—center for the dens of the axis; and E—center for the ventral arch of the atlas.

part of the body, the center for the dens, and the 2 lateral centers for the arch and the processes associated with the arch (Fig. 1 B, C, and E). The dens represents the body of the atlas. During the 3rd week after birth, 2 more centers appear. One, which represents the cranial epiphysis of the body of the axis, appears between the center for the dens and the center for the main part of the body, and the other, which forms the caudal epiphysis, appears at the caudal end of the body (Fig. 2 B and C). The 2 lateral centers come together in the mid-dorsal line to form the spinous process and eventually unite during the 3rd month. At about the same time, the

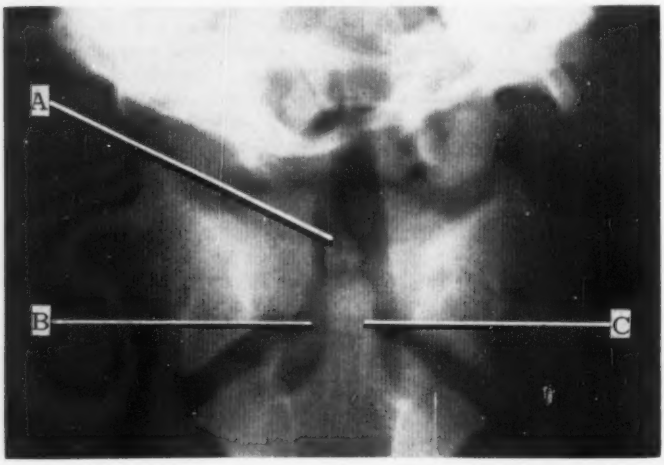


Fig. 3—Ventrodorsal view of the atlas and axis of a 65-day-old German Shepherd Dog. A—center for the apex of the dens; B—dens; and C—cranial end of the spinous process of the dens.

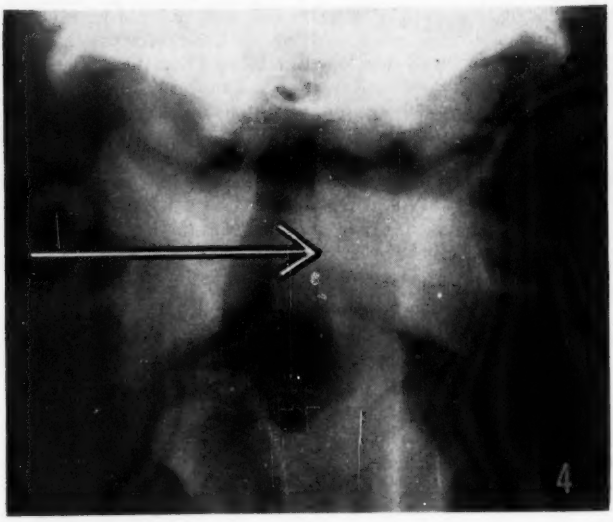
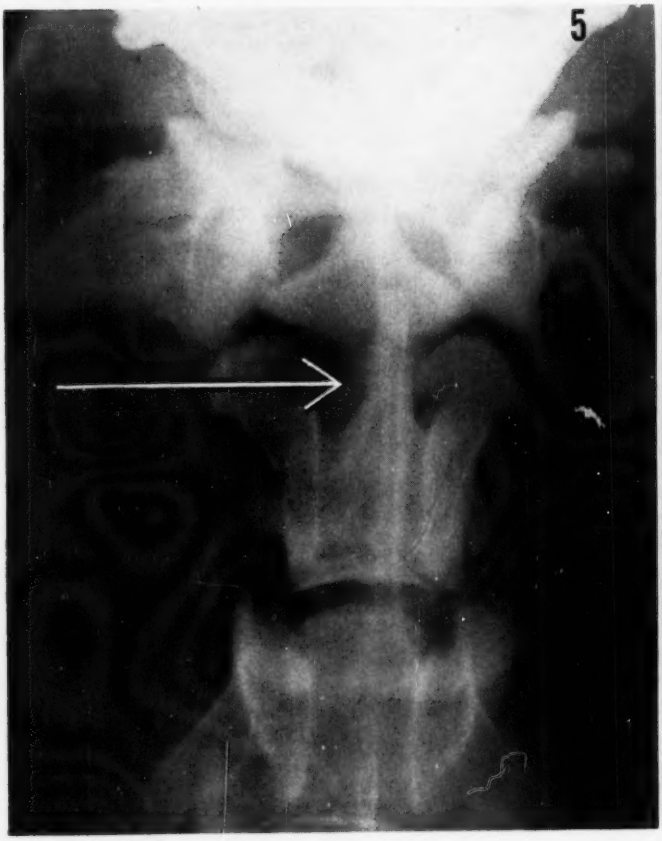


Fig. 4—Ventrodorsal view of the atlas and axis of a 95-day-old German Shepherd Dog. The arrow indicates the line of union of the lateral masses in the dorsal arch.

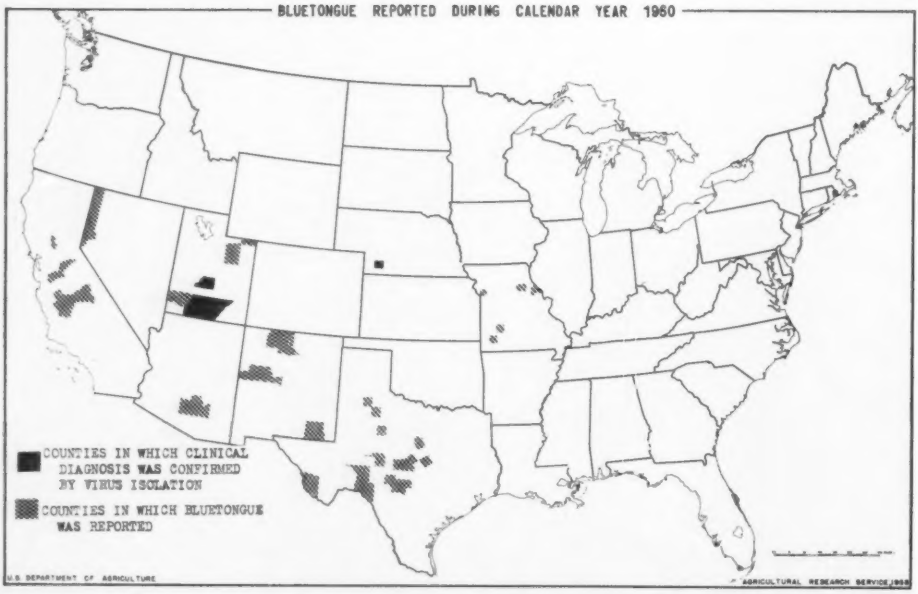
Fig. 5—Ventrodorsal view of the atlas, axis, and cervical vertebra 3. The arrow indicates the line of union between the center for the cranial epiphysis and the main part of the body.

Fig. 6—Ventrodorsal view of the cervical vertebrae 2 to 6 of a 214-day-old Collie. The union between the cranial epiphyses and the bodies is in a more advanced stage than that between caudal epiphyses and the bodies.



lateral centers also unite with the center for the main part of the body. In some dogs, a small accessory center for the apex of the dens makes its appearance at the cranial end of the principal center for the dens (Fig. 3 A). This apical center unites with the main part of the dens shortly after it has appeared. During the 4th month, the center for the cranial epiphysis of the body unites with the main part of the body (Fig. 5). The centers for the dens and the caudal epiphysis usually unite with the body sometime during the period between the 7th and the 9th month, that is, about the same time as the cranial and the caudal epiphyses unite with the bodies in the 3rd to the 7th cervical vertebrae.

The 3rd to the 7th cervical vertebrae develop from 5 centers of ossification each. The 2 lateral centers for the arch and its associated processes and the one center for the main part of the body are present and well developed at birth (Fig. 1). The other 2 centers, one each for the cranial and the caudal epiphyses, appear during the 3rd or the 4th week after birth, with the one for the cranial epiphysis usually appearing before the one for the caudal epiphysis (Fig. 2 A and C). The lateral centers unite with each other in the mid-dorsal line during the 3rd month and with the main part of the body during the 3rd or the 4th month. The cranial and caudal epiphyses unite with the main part of the body between the 7th and the 9th month; union usually starts in the 3rd and progresses caudad to the 7th, and the cranial epiphysis usually unites completely with the body before the caudal epiphysis does (Fig. 6).


BLUETONGUE REPORTED DURING CALENDAR YEAR 1960
COUNTIES IN WHICH CLINICAL DIAGNOSIS WAS CONFIRMED BY VIRUS ISOLATION
COUNTIES IN WHICH BLUETONGUE WAS REPORTED
U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE, 1960

States in which clinical diagnosis was confirmed by bluetongue virus isolation (1952-1960) are: Arizona, California, Colorado, Idaho, Kansas, Missouri, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah.

Isolation of Flury Rabies Vaccine Virus from the Salivary Gland of a Cat

John B. Vaughn, D.V.M., M.P.H., and Phyllis Gerhardt, B.

IN LABORATORY STUDIES, low egg passage (l.e.p.) Flury rabies vaccine* has been shown to induce a significant degree of protection against rabies in cats.[3] However, use of this vaccine in young cats is not recommended since deaths have been reported following vaccination.[9] Isolation of a strain of rabies virus from the salivary glands of a cat which died following vaccination with l.e.p. Flury vaccine has been reported.[1] The strain isolated resembled the vaccine strain in that the virus was able to multiply in embryonating chicken eggs and was nonpathogenic for rabbits, dogs, and cats when inoculated extraneurally as 1st- or 2nd-passage mouse brain material. Furthermore, this isolate failed to induce disease in hamsters and guinea pigs, animals which are relatively susceptible to extraneural l.e.p. Flury virus.

The investigators,[6] who isolated the Flury strain and adapted it to chicks, found it to differ from natural rabies virus in that "the character present in natural virus, which makes it possible for it to invade and multiply in the salivary glands, was eliminated by intracerebral passage for >100 generations in chicks."[2] Transfer of this strain to passage in chicken embryos was successful and resulted in the present l.e.p. vaccine strain.[5] The principal criteria for differentiating this strain from street virus are its ability to multiply in the chicken embryo, its lack of pathogenicity on extraneural inoculation for dogs, rabbits, and mice,[2,4] and its inability to induce the formation of Negri bodies.

The purpose of this report is to describe an additional isolation of rabies virus, presumably of the Flury vaccine strain, from the submaxillary salivary glands of a common domestic cat which died following vaccination with l.e.p. Flury vaccine.

Case History

A male common domestic cat, 5 months old, was vaccinated with 3 ml. of l.e.p. Flury vaccine (2 times the normal dose) intramuscularly in the right hindleg. Nineteen days later the cat developed partial paralysis in the inoculated leg; within 24 hours the opposite leg was involved. Shortly thereafter, paralysis became generalized, and death occurred 5 days after the onset of illness. There were no other clinical signs, nor was there a history of exposure to street rabies virus. The New Orleans area where the cat originated has been free from reported cases of animal rabies since 1957.

Materials and Methods

Immediately after the death of the cat, the brain and submaxillary salivary glands were removed. After examination of the brain for Negri bodies by Sellers' method,[8] both tissues were carefully homogenized to make 10% suspension in phosphate buffered diluent containing 10% normal horse serum, 2 mg. of streptomycin, and 500 units of penicillin per ml. These suspensions were then stored at −65 C. until tested.

Attempts to isolate virus were made by inoculating mice intracerebrally in groups of 6 per tissue suspension. Moribund mice were killed, their brains examined for Negri bodies, and portions of brains were homogenized as above for storage or passage.

All virus titrations were made by inoculating mice in groups of 6 with serial tenfold dilutions of tissue suspensions; 50% end points were determined by the Reed-Muench method.[7] Virus identification was based on serum neutralization tests using rabies hyperimmune or normal horse serum in constant dilution combined with parallel serial tenfold dilutions of tissue suspension containing virus.

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This study was supported by grants E3533 and E3340 from the Division of Research Grants, National Institutes of Health, USPHS.

The authors thank Drs. J. C. S. Paterson and John P. Fox for assistance with the preparation of this report and Mrs. Joanne Sirgo for technical assistance.

*Modified live virus, Flury strain, representing the 40-60th egg passage of the virus.

TABLE 1—Mouse LD_{50} Titer of Rabies Virus in Tissue Suspensions

Tissue	Mouse LD_{50} log titer of virus per gram
Original cat brain	3.0
Original cat salivary gland	2.5
1st passage mouse brain from original salivary gland suspension	6.0
2nd passage mouse brain from original salivary gland suspension	8.9

Various hosts were employed in characterizing the isolated strains. Swiss Albino mice, 21 to 35 days old were inoculated interacerebrally with volumes of 0.03 ml. Healthy dogs of mixed breeding, 4 to 5 months old and free from detectable neutralizing antibodies, were each given 0.25 ml. of inoculum in the masseter muscle. Healthy adult rabbits, hamsters, and guinea pigs were each given 0.2 ml. in the gastrocnemius muscle. Mice were observed for 21 days and all other animals for 60 days after inoculation. Brains were removed from all dead animals for Negri body examination and were tested for virus. Chicken embryos 7 days old were each given 0.2 ml. of inoculum via the yolk sac. After 10 days of incubation at 36.5 C., surviving embryos were harvested. These embryos and the brains from the dead animals were made into 10% suspensions and stored at −65 C. pending tests for the presence and identification of virus.

Results

All of 6 mice which were given cat brain tissue and 3 of 6 mice which were given submaxillary gland tissue had typical signs of rabies and died within 9 to 11 days. A subpassage from the 3 mice infected after being given submaxillary gland suspension resulted in signs of rabies in all of 10 mice and death within 7 to 9 days. On examination of the original cat brain and of the brains of all mice that died, no Negri bodies were found. However, 2nd mouse passage virus of submaxillary gland origin was identified as rabies virus by the neutralization test.

TABLE 2—Mouse LD_{50} Titer of Virus Recovered in Tissues of Embryonating Chicken Eggs After Yolk Sac Inoculations with 25 Mouse LD_{50} of Virus

Tissue	Mouse LD_{50} log titer of virus per gram
Chorioallantoic membrane	4.0
Amnionic membrane	5.5
Embryo	6.0
Yolk sac	4.6
Allantoic fluid	0

Determinations were made of the amounts of virus present in the original cat tissues and in the passage mouse brains (Table 1). Although the former contained only $10^{2.5}$ to $10^{3.0}$ LD_{50} per Gm., the virus content of mouse brain increased on passage to $10^{8.9}$ LD_{50} per Gm. in the 2nd passage of the submaxillary gland material. This latter passage material was employed to infect the several experimental animals described below. For chicken embryos, the material was diluted to contain 25 mouse LD_{50} per inoculum; for all other hosts, 10% tissue suspensions were used.

TABLE 3—Rabies Mortality in Animals Inoculated with Test Material*

Animal	No. inoculated	Deaths
Hamster	14	14
Rabbit	4	0
Guinea pig	10	8
Dog	4	0

*Test material was 10% suspension of 2nd passage mouse brain tissue from original salivary gland isolate. The titer was $10^{8.9}$ mouse LD_{50}/Gm.

The results of the chicken embryo studies are shown (Table 2). Inoculation of the isolate into the yolk sac resulted in growth and generalized distribution of the virus throughout the embryonating egg with the exception of the allantoic fluid. The concentration of the virus was highest in the embryo ($10^{6.0}$ LD_{50}/Gm.).

In Table 3, the results of pathogenicity studies in animals are shown. All of 4 rabbits and 4 dogs which were inoculated remained normal during the periods of observation, whereas 14 hamsters (100%) and 8 guinea pigs (80%) died from rabies within 13 to 24 days. Death was preceded in each instance by paralysis. Microscopic examinations for the presence of Negri bodies were negative in all cases. However, from the brain tissue of all animals that died, virus was recovered by mouse passage and identified as rabies virus by the neutralization test.

Discussion

The growth of the virus in embryonating chicken eggs, the pathogenicity for hamsters and guinea pigs, the nonpathogenicity for rabbits and dogs, and the absence of Negri bodies in mice, hamsters,

and guinea pigs are compatible with the criteria mentioned earlier for distinguishing the l.e.p. Flury vaccine virus from isolates of street virus. These results, in addition to the case history of the cat, strongly suggest that the isolate from the salivary glands of the cat was l.e.p. Flury vaccine virus. The finding of virus in the salivary glands of this cat, even in a low level ($10^{2.5}$ mouse LD_{50}/Gm.), evidently indicates that some degree of salivary tropism still persists in the vaccine virus that has been passed for more than 100 generations in chicks and 40 to 60 passages in embryonating eggs.

Our results constitute the 2nd reported isolation of l.e.p. Flury strain virus from cat salivary glands and resemble the results obtained previously[1] with the unexplained exception that their isolate was not shown to be pathogenic for hamsters and guinea pigs on extraneural inoculation.

Animals including man vary greatly from species to species with respect to susceptibility to extraneural infection with rabies virus. The data illustrate this in part (Table 3). Hamsters, guinea pigs (and cattle) are particularly susceptible. Cats and dogs occupy an intermediate position, young animals of both species having succumbed on rare occasions to the l.e.p. vaccine virus. Man is probably the most refractory species since apparently neither fixed rabies virus nor Flury strain virus will multiply extraneurally. This would seem to lead to the conclusion that any possible risk deriving from localization of l.e.p. virus in cat or other salivary glands would be virtually limited to hamsters, guinea pigs and, possibly, cattle.

Summary

Rabies virus was isolated from the submaxillary salvary glands of a cat which died following vaccination with low egg passage (l.e.p.) Flury rabies vaccine. The case history of the cat and the results of experimental studies in dogs, rabbits, hamsters, guinea pigs, and embryonating chicken eggs suggest that the agent isolated was l.e.p. Flury vaccine virus.

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Heartworms Enzootic in Eastern Massachusetts

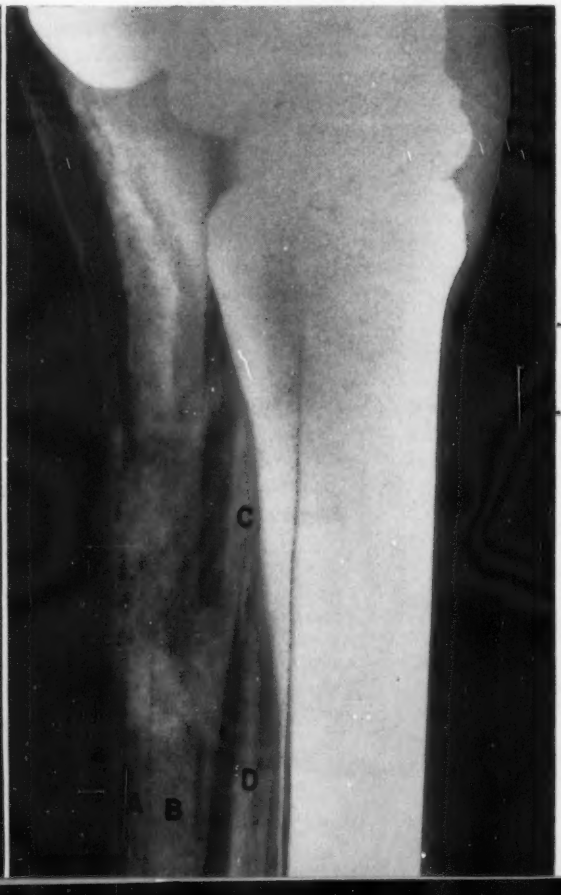
Medical investigators have found that *Dirofilaria immitis* is enzootic in the Boston area and that mosquitoes of the *Anopheles*, *Aedes*, and *Culex* genera were linked with transmission. Mosquitoes did not develop immunity to reinfection with *D. immitis*. Fleas did not appear to be vectors. Although flies ingested microfilariae when feeding on infected dogs, it was problematical whether they were susceptible hosts.—*Veterinarian, Massachusetts Vet. A. (Jan., 1961): 10.*

Tendon Radiography in the Horse

Fred L. Williams, Ph.C., and

Douglas Y. Campbell, D.V.M.

BY INJECTING air subcutaneously and into the tendon sheaths of horses, it was found that tendon outlines could be clearly shown on radiographs. Using air in combination with 5% sodium iodide,, 5% sodium iodide alone, and other radiopaque contrast medium, tendons could not be shown satisfactorily.



The forelegs of a 7-year-old gelding were prepared by clipping the hair and washing and disinfecting. Ten milliliters of 2% procaine hydrochloride was injected approximately 3 inches below the carpus on the lateral volar aspect of the foreleg over the superficial and deep flexor tendons. In another area 2 inches proximal to the fetlock on the lateral volar side of the leg, 10 cc. of procaine was injected also.

Then, 100 cc. of air was injected subcutaneously 3 inches below the carpus on the lateral side of the leg. After the leg was flexed to relieve the tension from the tendons, a 22-gauge, 1½-inch hypodermic needle was inserted between the superficial and deep flexor tendons inside the proximal flexor tendon sheath (carpal sheath); this was done 3 inches below the carpus on the lateral volar side of the leg. Then, 50 cc. of air was injected into the distal flexor tendon sheath (digital sheath) 2 inches proximal to the fetlock on the lateral side. This was facilitated by flexing the leg and thus separating the superficial and deep flexor tendons.

The superficial and deep flexor tendons, the inferior check ligament, and the suspensory ligament were plainly visible on radiography* (Fig. 1, 2, 3, 4).

The horse was examined 2 weeks after the air injections, and no indications of lameness or inflammation were present.

Radiographic technique used was 40 kv.p, 200 ma., 36-inch focus-film distance, and 1/30 sec. exposure. Ansco Monopak film (non-screen) was used.

Work on tendon radiography was done by Dr. Campbell as a special problem during his senior year (1960) in the College of Veterinary Medicine at Washington State University, under the direction of Fred L. Williams, assistant professor of Veterinary Clinical Medicine and Surgery.

*Tendons and ligaments were identified by Dr. Robert P. Worthman, associate professor, Veterinary Anatomy, College of Veterinary Medicine, Washington State University.

Fig. 1—(opposite page, above)—Lateral view of carpus area of the left foreleg of a horse. A—superficial flexor tendon; B—deep flexor tendon; C—interior check ligament; D—suspensory ligament.

Fig. 2—(opposite page, far left)—Lateral view of fetlock area of the left foreleg of a horse. A—superficial flexor tendon; B—deep flexor tendon; D—suspensory ligament.

Fig. 3—Lateral view of carpus area of the right foreleg of a horse. A—superficial flexor tendon; B—deep flexor tendon; C—inferior check ligament; D—suspensory ligament.

Fig. 4—Lateral view of fetlock area of the right foreleg of a horse. A—superficial flexor tendon; B—deep flexor tendon; C—inferior check ligament; D—suspensory ligament.

Deviation of the Upper Jaw and Nose in a Foal

Deviation of the upper jaw is rare in domestic animals but has been recorded in the horse, mule, reindeer, cow, sheep, dog, and pig.[1] The foal described in this report was born without assistance but was unable to nurse effectively because of the deviated upper jaw. It was killed, embalmed, and dissected.

Both the upper jaw and nose of the foal were deviated to the right, resulting in a concave surface on the right side of the head and a convex surface on the left. The upper lip and both nares were situated to the right of the median line, whereas the lower jaw was positioned normally (Fig. 1). The tongue protruded between the jaws. Muscles situated on the concave side were shorter and thicker than normal, and those on the convex side were longer and narrower. The m. levator nasolabialis was most affected; the left muscle was twice as long as the right. Origins and insertions of all facial muscles were normal, and vessels and nerves were distributed typically. The left parietal nasal cartilage was twice as long as the right one, and the cornu of the left alar cartilage was shorter than the one on the right. The left nasal opening was constricted, and the right nasal opening was large. The nasal septum was deviated to the right, and the left nasal cavity was smaller than the right with the rostral portion of the left ventral turbinate deviated to the right.

Fig. 1—Congenital deviation of the upper jaw and nose of this foal caused the tongue to permanently protrude and made nursing ineffective.

Only the maxilla, premaxilla, and nasal bones were malformed. Because of the curvature of the upper jaw, the left palatine process of the maxilla was narrow, the nasal process of the right premaxilla was 1/3 smaller than the left, and both of these processes and the nasal bones were twisted to the right.—*E. Deniz, D.V.M., and L. Z. McFarland, D.V.M., Ph.D., Department of Anatomy, School of Veterinary Medicine, University of California, Davis. Dr. Deniz was an I.C.A. participant from the University of Ankara, Turkey.*

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Studies on Acute Bovine Traumatic Reticuloperitonitis

I. Platform Method of Treatment

C. A. Hjerpe, D.V.M.

SEVERAL METHODS of treatment have been devised for bovine traumatic reticuloperitonitis (TRP). In 1863, a method for surgical removal of the foreign body was described.[13] Unquestionably, this is still the treatment of choice when the economics of the case are favorable. One clinician has reported 40 recoveries in 40 rumenotomies.[15] When the diagnosis is made promptly, poor surgical risks eliminated, and modern antibiotics used as supportive therapy, the recovery rate with the rumenotomy operation should approach 100%.

Literature Review

The platform method of treatment was described in 1892.[11] before the era of antibiotics. In recent years, several authors have reported on treatments that utilize magnets in various ways. One report[17] mentions 74 recoveries in 83 cows treated orally with magnets* and a single intramuscular dose of penicillin and streptomycin. This was found to be superior to a former method of treatment, which consisted of elevation of the front feet on a platform, withholding of food for 4 days, and medical treatment with antibiotics and laxatives. A device for retrieving ferrous metal *per os* from the reticulum has been described.[12] Magnets were found to have insufficient strength to do an efficient job of removing metal in this manner.

Another group of workers[14] successfully removed the offending foreign body from only 10 of 126 cows with TRP with this apparatus. Inhalation pneumonia occurred in several cattle, resulting from emesis induced by the procedure. They successfully retrieved the offending foreign body from 32 of 53 cows when a magnet was given orally and allowed to remain for a time before the magnetic probe was used.

A device for the removal of foreign bodies from the recticulum by paracentesis has been described.[4] A critical evaluation of the efficacy of this device in the treatment of clinical cases has not been reported. The use of the magnet in the prophylaxis of TRP has been studied.[5] When a large amount of metal was being consumed and attracted by the magnet, the weight of this mass on the floor of the reticulum in some instances resulted in severe ulceration and inception of clinical signs of TRP. The magnet does not invariably remain in the reticulum when administered orally and, as a result, prophylaxis or treatment dependent primarily on the presence of a magnet in the reticulum will not be entirely reliable. A 95.5% recovery rate has been reported in more than 1,000 cattle with TRP which were treated intraperitoneally with 3 to 5 million units of procaine penicillin G and 5 Gm. of dihydrostreptomycin sulfate in olive oil.[2] Severely affected cows were given 2 treatments. A platform was not used. Relapses occurred in 10%, most of them within 4 weeks of the initial attack.

The purpose of this report is to describe a satisfactory routine, by no means original, which has enabled the author to treat TRP economically.

Method

In all cases in which there is any reason to suspect TRP, the cow is placed on an inclined platform to raise the front feet 6 to 8 inches; 3 million units of procaine penicillin G and 5 Gm. of dihydrostreptomycin sulfate are administered intramuscularly, and a citrated blood sample is obtained for hematology. If there is any doubt as to the diagnosis, the owner is asked to telephone the following day and report on the cow's condition. By then, the results of the hemogram, the findings on the physical examination, and the response to treatment are all known. An intelligent opinion can

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*Alnico Magnets, Indiana Steel Products Co., Valparaiso, Ind.

then be given. If the diagnosis appears to be TRP, a 2nd treatment with antibiotics is usually recommended. Return calls are made and the antibiotics repeated until the cow's temperature is normal and she is beginning to eat, or until she is considered to be a poor risk and sent to slaughter. Recuperating cows are not allowed off the platform for 2 weeks. Using this procedure, a misdiagnosis will be made in some cows and they will be treated incorrectly. However, it is better to err in this manner, than to fail to recognize TRP promptly and initiate specific treatment.

In compiling data such as this, diagnostic errors are inevitable and will influence the accuracy of the statistics. Some of the conditions that can be confused with acute TRP are displaced abomasum, primary indigestion, acetonemia, anaplasmosis, leptospirosis, septic mastitis, septic metritis, hepatic abscesses and necrobacillosis, pyelonephritis, pneumonia, and abomasal ulcers.

To keep errors to a minimum, a careful and complete physical examination and a total leukocyte and differential leukocyte count were made. Milk and urine were examined grossly for evidence of mastitis, hematuria, hemoglobinuria, or pyuria. A vaginal examination was performed manually and the presence of any abnormal discharge recorded. Ureters were palpated for abnormalities. A rectal examination was made with special attention to size of pelvic lymph nodes; size, location, and sensitivity of the left kidney; and any other abnormalities. The vulvar mucosa and bulbar conjunctivas were examined for indications of anemia, icterus, petechiation, or congestion. Both sides of the thorax and the entire left paracostal and paralumbar region were thoroughly auscultated. External lymph nodes were palpated. Methods for demonstrating pain for diagnostic purposes in TRP were utilized (Part II). The rectal temperature was taken and, in animals thought to have TRP, the urine was tested for ketone bodies. The pupillary sensitivity to light was recorded and, if the diagnosis were questionable, an oral examination was made.

Results

During the 2-year period from Nov. 21, 1958, to Nov. 12, 1960, 96 cases of acute TRP were diagnosed in 93 cattle. Cows that had been sick no longer than 4 days and those in which complications obscured the diagnosis were excluded from the study. Of the 96 cases, 9 cattle were not treated (Table 1).

TABLE 1—Cattle with Traumatic Reticuloperitonitis Not Treated

Reason	No. cases	Diagnosed at necropsy
Recognizable pericarditis at 1st examination	3	2
Treatment recommended, but declined by owner	5	1
Vagal paralysis	1	1
Total	9	4

TABLE 2—Cows with Traumatic Reticuloperitonitis Which Were Treated but Did Not Recover

Reason	Cases (No.)	Diagnosed at necropsy
Uncomplicated peritonitis	2	2
Vagal paralysis	1	1
Definite pericarditis	4	3
probable pericarditis	1	----
Probable vagal paralysis	1	----
Total	9	6

One cow recovered when treated with antibiotics only (the owner refused to build a platform). Three cows recovered when treated orally with a magnet in addition to the platform and antibiotics. With these 13 cows excluded, a total of 83 cases of acute TRP in 81 cows were treated as described under "method." Of the 83 cows with TRP, 74 (89%) recovered. The reasons for failure of treatment are listed (Table 2).

Of the 27 treated cows ill for 3 to 4 days, 22 (81%) recovered. Of the 43 treated cows ill for less than 24 hours, 41 (95%) recovered. This emphasizes the importance of prompt diagnosis and early initiation of specific treatment. The average number of treatments per cow was 2.07 (Table 3).

TABLE 3—Number of Treatments per Cow

No of treatments	1	2	3	4	5
No. of cows	8	65	7	2	1

Only 2 lactating cows failed to return to approximately their former level of production. One had been producing well, even though it had been lactating for a year. The other cow had a prolonged severe attack one day after parturition. None of the cows in this study died in the barn. All postmortem examinations were made at the time of slaughter.

It had been stated that advanced pregnancy is part of the history in at least 50% of cattle with TRP.[16] In this study, 20 of the 96 attacks occurred during the period from 2 months prior to parturition to 1 week afterward. When TRP did occur dur-

TABLE 4—Outcome of Treatment of Cows with TRP with a History of Recovery from an Untreated Attack of TRP

No.	History	Outcome
1	Off feed for 24 hours, 3 days previously.	Treated and recovered.
2	Two indigestion attacks of 48 hours' duration during previous 5 weeks.	Treated and recovered.
3	Off feed for 4 days, 1 month previously.	Vagal paralysis.*
4	Indigestion 1 month previously.	Treated and recovered.
5	Off feed 3 weeks previously.	Treated and recovered.
6	Off feed for a week, 7 months previously.	Pericarditis.*
7	Pneumonia treated twice with antibiotics 1 month previously. Off feed several times since.	Treatment declined.

*Diagnosed at necropsy.

ing advanced pregnancy, there was a tendency toward greater severity. Of 15 cattle affected in the last 2 months of gestation, only 10 (67%) recovered. Perhaps this phenomenon is associated with increased intra-abdominal pressure and displacement of abdominal viscera by the gravid uterus. Of the 15 cows, 9 were not treated until the 3rd or 4th day of illness, and only 4 were treated within the first 24 hours of illness. The severity of the illness in the nonlactating animal is not readily apparent to the owner. Even if the severity is recognized, he is less likely to seek immediate veterinary service when milk production is not affected.

One objection that has been raised to the nonsurgical methods of treatment is the purported frequency of relapses. In these cows, treated with a platform and antibiotics, there were 4 relapses, a 5% incidence. Three of these that had relapses 2½, 3½, and 5 months after the initial attack were treated and recovered. The 4th cow had a relapse 21 days after the initial attack, 1 day after being removed from the platform. Although not a poor risk, the owner declined treatment, and she was sold. Two of the 93 cows had recovered after treatment from attacks that had occurred prior to this study. One relapse followed the initial attack by 7 weeks and the other by 1 year. Both cows were treated and recovered. I know of no cow that has had more than one relapse.

Seven of the 93 cows had had a previous severe illness that was probably TRP. They were not treated, or were not treated for TRP (Table 4).

Thus, 13 of the 93 cows in this study had had a suspected previous TRP attack. Six had been treated specifically and 7 had not. Ten of these 13 relapses occurred within 3½ months of the initial attack. Since there was no way of estimating the incidence of recovery from TRP without benefit of treatment during this study, there is no way of assessing the value of this treatment in reducing the incidence of relapses.

The heart rate is of value as a prognostic aid. Seventeen of the 87 treated cows had a heart rate of 88 or more beats per minute at the time of initial examination. Of these 17, 11 recovered and 6 did not. Thus, 6 of the 9 treated cows which did not recover had a heart rate of 88 or more at the initial examination; also, 6 of the 9 had a faster heart rate at the time of the final treatment than at the time of the initial examination. Of the 11 cows which recovered and which had initial heart rates of 88 or more, 8 had slower heart rates at the final treatment than at the initial examination. In late gestation, the upper normal limit of the heart rate is close to 90 beats per minute, and this must be taken into consideration in arriving at a prognosis. Other valuable prognostic aids were the response to treatment with respect to appetite, milk production, rumen motility, manure production, and general attitude.

Discussion

In every cow with TRP, peritonitis is present. Treatment is directed toward the control of the infection and the facilitation of the "walling off" of the foreign body. The main function of the platform is probably to minimize the movement of tissues in the area of the circumscribed peritonitis in order to facilitate the walling off process. The latter seems to proceed more efficiently when bacterial infection and systemic reaction are held to a minimum with

generous use of appropriate antibiotics. It is unlikely that the elevation of the front feet can effect the return of the foreign body to the reticulum. In fact, it is desirable that it not return to the lumen, where it would likely result in a 2nd penetration. If the foreign body is thoroughly encased in a thick, tough connective tissue capsule, the results of this study indicate that it is not likely to cause further trouble.

Of the 9 treated cows that failed to recover, the diagnosis was confirmed at slaughter in 6. Three of these had pericarditis; 1 had vagal paralysis. In 1 of the other 2, the foreign body was entirely outside the digestive tract. This means that only 1 of the 6 would have benefited from a rumenotomy at the time medical treatment was abandoned. If the economics of the case warrants surgical intervention, this should be performed at once, or at least not delayed more than 48 hours, when it appears that medical treatment is not producing satisfactory results.

Studies on Acute Bovine Traumatic Reticuloperitonitis

II. Signs of Traumatic Reticuloperitonitis

C. A. Hjerpe, D.V.M.

The veterinary literature abounds with case reports and discussions of the symptomatology of bovine traumatic reticuloperitonitis (TRP). Most of these discussions fail to emphasize the extreme variability in clinical symptomatology. One worker[10] produced acute TRP in 10 cows, experimentally, and made observations of the temperature, heart rate, respiratory rate, total leukocyte and differential leukocyte counts, hay and grain consumption, manure production, milk production, rumen motility, reflex sensitivity, height of the thoracic spine, and degree of sensitivity in the xiphoid region. Observations were made twice daily for 5 days before TRP occurred and for 6 days afterward. The findings were shown in graphs, plotting the variations in these findings against time. Variations were observed in the normal values of certain observations, as were occasional returns to normal values in sick animals.

It was concluded that there were no pathognomonic signs and, due to variations in individual signs, diagnosis should be based on the composite findings of the physical examination and hemogram. The most reliable early clinical manifestations were elevated temperature, neutrophilia, disturbed appetite for grain, pain in the xiphoid region, decreased milk production, rumen atony, and constipation. Urinalysis was negative.

Hay consumption was not much affected in these 10 cows. The clinical manifestations were less severe than was usual in this worker's[10] experience, indicating that many mild cases may be overlooked. The report is a valuable contribution to knowledge of the clinical manifestations during the course of acute TRP. However, it does not indicate how much deviation from the "idealized" syndrome can be expected in the individual cow with TRP at the initial examination.

This study was made in an attempt to determine the incidence of these deviations from the typical symptomatology, in the hope that better knowledge of these deviations would result in greater diagnostic accuracy.

Method

During a 2-year period, 96 cases of acute TRP involving a total of 93 cattle were diagnosed. Differential diagnosis was established as described (Part

I), after consideration of the anamnesis, the findings on the physical examination, the hemogram, and the response to treatment. In addition to the general physical examination, special attention was directed to 14 other observations. These were the rectal temperature, heart and respiratory rates, presence of ketone bodies in the urine, degree of reduction in milk flow, and presence of emesis, audible grunting or groaning, kyphosis, and muscular trembling or shivering. The stethoscope was placed over the trachea, to note any "catching" of the breath during inspirations. The presence of bloat was determined by palpation in the left paralumbar fossa to detect the accumulation of gas in the dorsal part of the rumen over firmly settled ingesta, an indication of rumen stasis.

Three standard techniques for demonstrating anterior abdominal pain were utilized. Test "F" consisted of an attempt to demonstrate pain by kneading with the fist in the region posterior to the xiphoid cartilage. Test "R" was performed by listening over the trachea with a stethoscope and pinching the cow over the withers, just behind the upper margin of the scapulae, at the exact height of an inspiration. The test is considered positive for pain when the cow can be made to "catch her breath" by this procedure. Test "P" consisted of pinching the cow over the withers in the same manner as in test "R" and estimating the ease with which she could be made to arch her back ventrally. When she readily "pinched down" the test was considered to be negative and pain absent. Some of these signs vary in degree from barely discernible to markedly positive. When the presence of a sign was considered questionable, it was recorded as absent. For the purposes of this study, cows ill for 4 days or less were considered to have acute cases. Cows ill for 5 days or more were excluded. The recorded observations were made at the 1st examination before any treatment had been initiated.

Results

A total of 96 acute TRP cases were diagnosed during this study. Acute cases were not diagnosed in bulls, because most herds in the area* utilize artificial insemination. There were 72 cases in Holstein-Friesians, 18 in Guernseys, and 1 each in a Brown Swiss, a Jersey, and a Hereford. This roughly approximates the breed distribution in the area

TABLE 1—Age Distribution of Cows with Traumatic Reticuloperitonitis

Age (years)	1	2	3	4	5	6	7	8	9	10
No. of cows	1	10	15	11	16	27	5	6	1	1

TABLE 2—Seasonal Incidence of Traumatic Reticuloperitonitis

Month	No. of cases
January	9
February	12
March	12
April	12
May	7
June	2
July	5
August	10
September	6
October	9
November	9
December	3

The age distribution (Table 1) roughly approximates the age distribution in the area, except that the incidence in cattle less than 2 years old appears too low. Cattle in this age group frequently are not observed closely. Failure to detect the illness may be a factor, although, during this time, only one chronic case was diagnosed in a yearling calf. It is likely that cattle in this age group feed more carefully and are less prone to consume foreign bodies.

The incidence was less than the mean (8 cases per month) for the months of May, June, July, and September. In this area, these are the months when a large part of the diet consists of grazed pasture. In August, pasture is usually short, and supplementary feeding with hay and silage is increased. It appears that cows are less likely to consume foreign bodies when grazing than when fed hay and silage. Most grain-grinding operations now include passing the grain mix over powerful magnets to remove any foreign bodies of ferrous composition. Perhaps a similar feature could be incorporated in hay balers and forage harvesters.

Incidence of various signs in the 96 cattle is compared with cows ill for less than 24 hours, for 3 to 4 days, and 8 pericarditis-free cows confirmed as having TRP on necropsy (Table 3).

Ranges and means of rectal temperatures, heart rates, and respiratory rates in these 4 groups of cattle are presented (Table 4).

Of the total 96 cows, 63% had rectal temperatures over 102 F. at the initial examination; of the cows ill for 24 hours or less, 70% had initial temperatures over

*Albany County, New York

TABLE 3—Comparative Incidence of Clinical Signs (%) in Cows with Traumatic Reticuloperitonitis

Observation	All cows with TRP	24 hr. illness	3 to 4 day illness	Confirmed at necropsy
Test R pos.*	41	33	48	63
Test F pos.**	45	41	48	50
Test P pos.†	56	63	45	63
"Catchy" inspirations present	33	39	29	25
Audible grunt or groan present	15	9	13	13
Kyphosis present	43	57	52	63
Trembling present	13	15	3	13
Bloat present	49	46	48	38
Emesis present	2	0	6	0

*Catch breath when pinched over withers. **Pain in xiphoid region. †Pinching over withers failed to produce momentary lordosis.

102 F.; and, of the cows ill for 3 to 4 days, 58% had initial temperatures over 102 F.

The drop in milk production reported by the owner was an approximation in most cases, since few farmers in the area keep daily records of milk weights. The reduction ranged from 25 to 100%. The average for all cows was 76%. The normal daily production of the individual, the stage of lactation, and the duration of illness (up to 4 days) seemed to have no consistent effect on the degree to which milk production was affected.

Clinical signs occurred in 30 of 96 cows during the first 2 months following parturition. The urine of each of these cows was tested for ketone bodies; urine from 8 cows reacted positively. When a reaction occurred, it was invariably a strong 3-plus to 4-plus reaction. This secondary acetonemia was not a therapeutic problem. One treatment of 500 cc. of 50% dextrose was the only ketosis therapy needed, in conjunction with specific TRP therapy.

TABLE 4—Rectal Temperatures and Heart and Respiratory Rates* in Cattle with Traumatic Reticuloperitonitis

	Temp. (F.)	Heart rate/min.	Respir. rate/min.
All 96 cows			
ranges	99.0-105.8	52-116	10-120
means	102.7	76	34
24-hr. illness			
ranges	99.0-105.2	54-100	20-120
means	102.8	77	35
3 to 4 days' illness			
ranges	100.8-104.0	52-116	10-72
means	102.5	74	32
Necropsy confirmed			
ranges	100.5-104.0	68-92	10-52
means	102.2	83	35

*Frank pericarditis cases not included.

Discussion

The purpose of this study was to determine how frequently the clinical manifestations of acute TRP could be expected to deviate from those described in the "idealized textbook case," and to determine whether a more exact knowledge of these deviations would increase diagnostic accuracy. It has been shown that the sooner specific treatment is begun, the higher the recovery rate will be (Part I).

During the course of the study, it became evident that no sign was invariably present. No sign was found that did not occur, at least occasionally, in other diseases. There was no consistent contemporary association or disassociation of any 2 or more signs, except that as the respiratory rate increased, inspirations were less likely to be "catchy." Muscular trembling was more likely to occur during the first 24 hours of illness. There did not appear to be much difference in degree or incidence of other signs between illnesses of less than 24 hours' duration and those of 3 to 4 days' duration. An accurate diagnosis must be based upon a consideration of all the clinical manifestations and degree of severity when present. Total and differential leukocyte counts are valuable in establishing the diagnosis (Part III). When the diagnosis is still in doubt, the response to treatment may be helpful. When improvement is not satisfactory, exploratory surgery is indicated when the economics of the case permits.

The most valuable diagnostic signs were temperature elevation, presence of pain in the xiphoid region, degree of decrease in appetite and milk production, decreased rumen motility, and decreased manure production.

Studies on Acute Bovine Traumatic Reticuloperitonitis

III. Hematology

C. A. Hjerpe, D.V.M.

Several excellent studies of the hematology of acute bovine traumatic reticuloperitonitis (TRP) have been published. The hematologic changes occurring during the course of acute TRP, produced experimentally in limited numbers of cattle have been reported.[8,10] The differential leukocyte counts in 500 acute and chronic cases of bovine TRP have been reported.[6] No distinction was made between segmented and unsegmented neutrophils. The total leukocyte counts were not included in the report, but the authors state that they were all within the normal range of 4,000 to 12,000/cmm. The diagnoses were confirmed by rumenotomy.

The purpose of this study was to ascertain what deviations from the "idealized" values can be expected in total leukocyte and differential leukocyte counts in a large number of field cases of acute TRP. A single blood sample was obtained at the time of the initial examination before treatment was begun. Total leukocyte counts were done in 90 cases. Differential leukocyte counts were done in 95 cases. Both counts were done in 90 cases.

Method

Diagnosis was established in a manner previously described (Parts I and II). Cattle with TRP of 5 days' duration or longer were excluded from the study. Blood was obtained from the mammary vein at the time of the initial examination. The total leukocyte count was performed in a manner described previously,[3] except that sodium citrate was substituted for potassium oxalate as an anticoagulant, and 3% acetic acid for 5% acetic acid as diluent. The smears used in the differential leukocyte count were made in the barn from uncitrated blood remaining in the 15-gauge California bleeding needle after the citrated sample was obtained. The smears were stained with Wright's-Giemsa stain. Basophils were ignored in the differential count. Neutrophils with any evidence of segmentation were classed as segmenters. In each smear, 100 leukocytes were counted.

Results

The hemograms of the 92 cows free of frank pericarditis at the initial examination were compared with similar cows that were ill less than 24 hours, 3 to 4 days, and with 3 cows with frank pericarditis (Table 1). Also indicated is a summary of hemograms of 8 cows free of frank pericarditis at the time of the initial examination and confirmed as TRP by necropsy.

In the more chronic cases, hematologic deviations from the normal were less pronounced. Excluding the 3 cows with pericarditis, 38% of the 87 cows with acute TRP for which counts were available had a total leukocyte count in excess of the upper normal limit of 13,000/cmm. Of the 45 cows ill less than 24 hours, 49% had a leukocyte count in excess of 13,000/cmm. For the cows ill 3 to 4 days, the corresponding incidence was 24%.

In most cases of primary indigestion, the incidence of unsegmented neutrophils in the differential leukocyte count does not exceed 6 to 7%. In this study, 67% of the 92 cows free of frank pericarditis and on which a differential count was available had 7% or more unsegmented neutrophils. The corresponding values for cows ill less

TABLE 1—Hemogram Ranges and Means in Cattle with Traumatic Reticuloperitonitis

Total and differential WBC count	Total cows (92)	Cows ill 1 day (45)	Cows ill 3 to 4 days (29)	Cows with pericarditis (3)	Cows with TRP confirmed on necropsy (8)	Normal values*
WBC/cmm.						
range	2,100-25,200	2,100-25,200	3,800-17,600	14,500-27,700	5,800-25,200	4,500-13,000
mean	11,661	12,135	10,388	20,600	12,844	....
Segmented neut. (%)						
range	7-70	7-68	8-70	36-62	37-66	15-55
mean	44.9	45.6	42.1	47.3	52.6	30.0
Unseg. neut. (%)						
range	0-80	1-48	0-80	12-26	0-25	0-5
mean	12.6	14.8	10.3	20.7	10.9	....
Eosinophil (%)						
range	0-24	0-24	0-24	0-6	0-6	1-15
mean	5.1	3.6	8.2	3.3	1.5	8.0
Monocyte (%)						
range	0-20	0-8	0-16	0-4	0-5	3-15
mean	3.1	2.4	2.9	1.3	1.3	9.0
Lymphocyte (%)						
range	6-76	9-76	6-60	22-38	16-48	40-70
mean	34.3	33.7	36.6	28.0	32.8	52.0

*Coffin's[2] normal values slightly modified by Bentinck-Smith.[1]

than 24 hours and 3 to 4 days were 76 and 52%, respectively. Of the 87 cows free of frank pericarditis for which both total and differential leukocyte counts were available, 78% had either a total count in excess of 13,000/cmm., 7% unsegmented leukocytes, or both. The corresponding figures, for cows ill less than 24 hours and those ill 3 to 4 days, were 87 and 59%, respectively.

The normal lymphocyte: neutrophil ratio is 1:0 to 1:7.[3] In 84% of 92 cows free of frank pericarditis the number of neutrophils exceeded the lymphocytes. The corresponding values for cows ill less than 24 hours and 3 to 4 days were 84 and 79%, respectively.

Discussion

It has been reported that a monocyte percentage of 5 or more, with a leveling of the lymphocyte:neutrophil ratio, indicates a poor prognosis for surgical intervention in TRP.[6] In this study, only one count of this type was found. The cow recovered without complications. Evidence indicated that hemograms were not of any prognostic value for cows treated with a platform and antibiotics.

Three types of alteration in the hemogram occurred in acute TRP and were of diagnostic value. These were: (1) elevation of the total leukocyte count in excess of 13,000/cmm.; (2) increase in the incidence of unsegmented neutrophils in the differential leukocyte count in excess of the upper normal limit of 5%; (3) reversal of the normal lymphocyte:neutrophil ratio of 1:0 to 1:7. In most instances, when TRP is present, at least one of these changes will be evident in a single hemogram. However, at times all these changes are so minimal that, if too much importance is attached to one hemogram, TRP may be overlooked when actually present. Sometime during the course of every case of TRP the characteristic hematologic alterations will occur. However, occasional returns to near normal values do occur, and hematologic determinations performed during such a period may be misleading. This can be overcome by making several counts at 12- to 24-hour intervals. Under most conditions, this is too time-consuming to be practical.

These same hematologic alterations occur in many bacterial infections and are by no means specific for TRP. Severe stress, as occurs at parturition, can produce identical changes in the hemogram.[1] Administration of corticosteroids will produce the same effect. For these reasons, the hemogram should be used only as an aid to diagnosis, along with the findings of the physical examination and the response to treatment. The hemogram is of most value in differentiating TRP from milder, nonin-

fectious conditions, such as primary indigestion.

When the hematologic alterations are suggestive of a bacterial infection, an effort should be made to localize the suspected infection to an organ system. When the infection cannot be localized, and no evidence is found to indicate the presence of a specific septicemic disease, the clinician is usually justified in considering the clinical diagnosis to be TRP, particularly when there is some indication of digestive impairment. In some instances, a clinical differentiation between primary indigestion and TRP cannot be made without performing a laparotomy. Likewise, certain cases of leptospirosis, abomasal ulcers, and liver abscesses will not be differentiated from TRP by hematologic determinations and physical examination alone.

Summary

Data are presented on 96 cases of acute traumatic reticuloperitonitis (TRP) in cattle. A routine for diagnosis and treatment of acute TRP with antibiotics and elevation of the front feet on a platform is described. Of 83 cows with acute cases, 74 recovered when treated. Superior results were obtained when treatment was begun within 24 hours of clinical signs; there was a 5% relapse rate.

A routine for diagnosis and treatment with special emphasis on clinical symptomatology is discussed. Along with a general physical examination, 14 other observations were made. Also, special tests for demonstrating pain in the anterior abdomen of the cow were made. The most valuable diagnostic signs were temperature elevation, presence of pain in the xiphoid region, degree of decrease in appetite and milk production, decreased rumen motility, and decreased manure production.

The hemograms of 95 cows with acute TRP were characterized. Three alterations which were of value in the differential diagnosis of acute TRP were: (1) elevation of the total leukocyte count in excess of 13,000/cmm.; (2) increase in the incidence of unsegmented neutrophils in the differential count in excess of the upper normal limit of 5%; (3) reversal of the normal lymphocyte:neutrophil ratio of 1:0 to 1:7.

Although the hemogram is of considerable value as a diagnostic aid in acute TRP, these alterations are nonspecific and are seen in association with other bacterial infections, following severe stress such as occurs at parturition, and following the administration of corticosteroids. Moreover, occasional returns to near normal hematologic values do occur during the course of TRP, and hemograms performed during such a period may be misleading. The hemogram should be used only as an aid to diagnosis with primary attention, assigned to the physical examination.

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Immunogenicity of 2 Infectious Bovine Rhinotracheitis Vaccines

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INFECTIOUS BOVINE rhinotracheitis (IBR) vaccine produced in bovine tissue culture has been made available for veterinary use. Evaluation of this type of vaccine has been reported.[1,3,6] This study is concerned with the comparative immunogenicity of a live-virus vaccine and a formalin-killed-virus vaccine.

Materials and Methods

Virus.—One strain of virus* used for preparation of vaccine had been passed 80 times in bovine kidney cell (BKC) cultures and modified by 22 passages in canine kidney cell (DKC) cultures. Another strain from the same source was isolated from lung tissue of a calf which had been infected experimentally. The calf was killed at the acute phase of the disease. This virus was passed serially through 3 bovine kidney cell cultures before being used for serum neutralization tests. The 3rd strain of virus, designated as "Cooper's isolate," was serially passed through 10 bovine kidney cell cultures and had been isolated originally from cattle naturally infected with IBR. This virus was used as the challenging strain with a known titer of $10^{6.2}$ $TCID_{50}$/ml.

Tissue Culture.—Primary monolayer cell culture of bovine or canine kidney cortex was prepared by using a modification of the trypsin digestion method of Youngner.[7] The trypsin digestion was carried out mainly at 5 C. for about 16 hours after a preliminary digestion of 30 minutes at room temperature. The medium used was composed of Eagle's nutrients, 0.5% lactalbumin hydrolysate and 5% horse serum (1% horse serum for vaccine production).

Titration.—The virus titers were determined by observing cytopathic changes of the cultured cells until the changes were completed. The infectivity titers ($TCID_{50}$/ml.) were calculated by the Reed and Muench method.[4] The titers of serum samples were obtained from both the serums collected pre- and postvaccination. The serums were inactivated at 56 C. for 30 minutes before an equal volume of medium containing 1,000 $TCID_{50}$/ml. was added to each serum dilution to be tested. The virus and serum mixtures were incubated at room temperature for no longer than 2 hr. and cultivated at 37 C. in the tissue culture. Controls of virus, serum, and culture itself were used. The results of titration were determined when there was 100% degeneration of the virus control cells.

Vaccines.—Two vaccines were used in this study: 1) Tissue culture-modified (MIBR) live-virus vaccine. This was prepared from virus cultured in BKC culture and then in DKC culture, as indicated previously.

2) Formalin-killed-virus vaccine. The virus isolated from the calf lung tissue and cultured in BKC was used. Virus culture was collected by clarifying the medium after 100% degeneration of cells and centrifuging at 2,000 G. for 1 hour. Formalin was added to the supernatant fluid to give a final concentration of 1:4,000. The inactivation procedure has been described elsewhere.[5] Portions of the formalin-killed-virus material were tested for residual infectivity in tissue culture and found to be negative. Ten parts of the formalin-killed-virus material were then homogenized with 1 part of Freund's adjuvant[5] to form the vaccine.

Vaccination.—Forty cattle weighing 700 lb. each were fed a grain ration containing equal parts of corn, milo, and barley and supplemented with alfalfa hay and minerals. Neutralization tests performed on the serum samples from all the cattle gave negative results for IBR antibodies immediately before vaccination.

The cattle were allotted to 4 groups of 10 each. Cattle in 1 group were each inoculated intramuscularly with 2 ml. of formalin-killed-virus vaccine and those of the 2nd group with 2 ml. of MIBR virus vaccine. Cattle in the 3rd group were quartered with the MIBR virus vaccine-inoculated cattle to serve as contact controls. The remaining 10 cattle were separated from the rest to serve as frank controls.

Daily body temperatures and observations were made for each animal 7 days prior to vaccination and continued until 14 days after challenge of immunity. Blood samples from each animal were taken immediately before vaccination and also before challenge of immunity for use in neutralization tests.

Challenge of Immunity.—The immunity of all cattle was challenged with 5 ml. of virulent virus (Cooper's isolate), intratracheally, 14 days after vaccination.

From the Research Department, Diamond Laboratories, Des Moines, Iowa (Zuschek), and the College of Veterinary Medicine, Colorado State University, Fort Collins (Chow).

*Obtained from the Veterinary Virus Research Institute, Cornell University, Ithaca, N.Y.

Table 1—Neutralizing Titers of Serums of Cattle Vaccinated with Either MIBR Virus Vaccine or Formalin-Killed-Virus Vaccine of IBR

Cattle group	Serum-neutralization titers*										
	Pre-vaccination**	Postvaccination (cattle No.)									Av. titers
		1	2	3	4	5	6	7	8	9	10	
Frank controls	0	0	0	0	0	0	0	0	0	0	0	0
Killed virus-vaccinated	0	4	12	12	4	12	4	36	37	12	12	14.5
Contact controls	0	0	0	0	0	0	0	0	0	0	0	0
MIBR virus-vaccinated	0	108	36	12	36	36	108	36	12	12	12	40.8

*Titers expressed as reciprocal of highest serum dilution inhibiting growth of 1,000 $TCID_{50}$ of virus in BKC. **All the prevaccination serums were negative to serum-neutralization test.

Table 2—Comparative Efficacy of a Modified Live-Virus Vaccine and a Formalin-Killed-Virus Vaccine Against Cattle with IBR

Cattle (10/group)	No. of cattle with fevers > 103 F. and with clinical signs of IBR on days after challenge								Total No. with disease
	1	2	3	4	5	6	7	8	
Frank controls	0	0	6	7	8	3	1	0	8**
Killed-virus-vaccinated	0	0	1*	0	0	0	0	0	0
Contact controls	0	0	4	6	7	1	0	0	7**
MIBR virus-vaccinated	0	0	0	0	0	0	0	0	0

*Transient elevated body temperature with no other signs of disease. **Had significant difference ($P < 0.01$).

Results and Discussion

Several observations could be made from the results of these studies (Table 1 and 2). None of the 40 cattle had any prevaccination neutralizing titer. None of the contact control cattle had a neutralizing titer to IBR after the vaccination, indicating that IBR virus probably had not been shed from the vaccinated cattle during the test period. The statistical test ($P<0.01$) of the susceptibility of contact control cattle to the challenging virus also supports this belief (Table 2). All cattle vaccinated with either formalin-killed-virus vaccine or MIBR virus vaccine developed neutralizing titers 2 weeks after vaccination. However, the neutralizing antibody level produced by the MIBR virus vaccine was approximately 3 times higher than that produced by the formalin-killed-virus vaccine. This indicates that the MIBR virus vaccine has higher antigenicity and, therefore, might be expected to be more effective. Although the level of neutralizing antibodies may not necessarily be a measure of resistance to a specific virus disease, in this case, it is evident that the level of neutralizing antibodies produced by either of the 2 types of vaccines was high enough to prevent cattle developing clinical reactions after challenge (Table 2). In the formalin-killed-virus vaccine group, 1 animal had a transient rise of body temperature for 1 day without any other clinical signs of disease. In both control groups, cattle had the characteristic febrile response accompanied by clinical signs[2] when their immunity was challenged with virulent virus (Cooper's isolate) 2 weeks after vaccination. Both vaccines have given evidence that they are safe to use and effective in the prevention of IBR.

Summary

Two types of vaccine for infectious bovine rhinotracheitis, a tissue culture-modified live-virus vaccine and a formalin-killed-virus vaccine, produced sufficient immunity in cattle to protect against subsequent challenge with virulent live virus.

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A Nitrofuran Coccidiostat Aids in Control of Pullorum Disease Under Stress Conditions

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FEED CONTAINING 1 lb. per ton of a nitrofurazone-furazolidone preparation* (0.0055% nitrofurazone and 0.0011% furazolidone) has been demonstrated[3] to be effective against *Eimeria tenella* and *Eimeria necatrix* and has been used commercially for this purpose. Concomitant protozoal and bacterial infections occur under natural conditions; thus, a coccidiostat having antibacterial properties is desirable. The purpose of this experiment was to determine if the nitrofurazone-furazolidone preparation would reduce morbidity and mortality of pullorum disease when used as a feed additive for the control of coccidiosis. To do this, it was necessary to determine if experimental birds had coccidiosis or other infections.

A practical test of a drug depends on its performance under field conditions where normal densities of bacterial and parasitic infections are encountered[2]; thus, floor pen studies were employed in this experiment.

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*Bifuran, Norwich Pharmacal Co., Norwich, N.Y.

Materials and Methods

The experiment utilized 2 pens of chicks on a feed containing 1 lb. of the nitrofurazone-furazolidone preparation per ton, 2 on feed containing nicarbazin, and 2 on nonmedicated rations. The nicarbazin was used as a reference control coccidiostat at a concentration of 0.0125%.

In each of 6 floor pens, 100 chicks, 2 hours old, were exposed to pullorum disease by introducing 30 marked "seeder" chicks, 2 hours old, that each had been given a broth culture of *Salmonella pullorum, per os.* After 10 days, surviving seeder chicks were removed. Mortality was recorded daily, and feed consumption, body weights, and edibility were determined at the end of the experiment 8 weeks later. Causes of deaths were determined by routine diagnostic procedures.

Other trials have indicated that low brooder temperatures (below 95 F.) for the 1st 10 days after exposure were necessary to cause death in exposed chicks (Table 1). In this experiment, the temperature at the edge of brooders was approximately 80 F. Beginning on postexposure day 5, brooders were turned off for 6 hours; the length of this reduced heat period was increased daily. On day 17, all chicks were "water-vaccinated" against Newcastle disease and infectious bronchitis. A stress was added during the "take" period on day 22 when brooders were shut off completely. During the reduced heat period, pen temperatures fluctuated between 46 and 80 F.

At the end of the experiment, 4 birds from each pen were wing-banded, allotted to 2 groups, and placed in batteries, making a total of 12 birds in each of 2 batteries. Each of 2 additional batteries contained 12 coccidiosis-susceptible chickens 8 weeks

TABLE 1—Influence of Brooder Temperature on Mortality of Chicks with Pullorum Disease

Floor pen (No.)	No. of chicks per pen	Status	No. that died within 14 days after exposure	Brooder temperature (F.)
1	30	Inoculated*	18	90
	100	Exposed but not inoculated	1	90
2	30	Inoculated	24	80
	100	Exposed but not inoculated	44	80
3	130	Noninoculated, nonexposed controls	3	80

*With a broth culture of Salmonella pullorum, per os.

TABLE 2—Mortality Results, Weight Gains, and Inspection-for-Edibility Results of Chickens at 8 Weeks of Age

Medication	No. chicks per floor pen at start	Died (%)	Av. body weight survivors (lb.)	Survivors condemnable (%)	Edible (%)
1 lb./ton (0.0055% nitrofurazone and 0.011% furazolidone)*	100 (rep. 1)	11	2.27	16	74
	100 (rep. 2)	19	2.25	19	65
Nicarbazin (0.0125%)	100 (rep. 1)	52	1.72	68	15
	100 (rep. 2)	33	1.90	49	34
Nonmedicated (infected)	100 (rep. 1)	55	1.89	55	20
	100 (rep. 2)	46	1.69	74	14

*Bifuran (export premix), Norwich Pharmacal Co., Norwich, N.Y.

old. Chicks in one principal group derived from the floor pens and in one group of coccidiosis-susceptible controls were inoculated *per os* with a suspension of *E. tenella*. The remaining group and coccidiosis susceptible controls were inoculated with *E. necatrix*.

Results and Discussion

Results relative to mortality, body weights, and condemnable and edible birds at the termination of the experiment are given (Table 2). Large differences in average body weights were due to many so-called "runts" in the nonmedicated and nicarbazin-medicated groups. The birds given the nitrofurazone-furazolidone preparation were more uniform in size. Mortality rates and body weights of chicks fed nicarbazin were similar to those of nonmedicated controls, indicating little or no activity of this agent against *S. pullorum*. No signs of clinical coccidiosis were observed during this phase of the experiment, nor was coccidiosis observed at necropsy.

Mortality is an important criterion for the evaluation of a drug but, in the final analysis, edibility of the survivors can be even more important. Therefore, close attention was paid to this point during necropsy. A condemnable bird was considered one that had extensive lesions of pullorum disease in one or more of the internal organs, a lack of muscular development, or both.

Of the *E. tenella*-susceptible controls that were inoculated with this species, 2 died; clinical evidence of coccidial infection was extensive. None of the 12 principals originating from the floor pens died but, 1 week after inoculation, clinical evidence of cecal coccidiosis was present in chickens from all pens. Thus, it appears that some exposure to cecal coccidiosis had occurred in the floor pens but that the disease was of a mild, subclinical nature. At necropsy of birds inoculated with *E. necatrix*, coccidiosis was found in all birds to a similar degree, which indicates no exposure to this species.

Salmonella infections in chickens and turkeys have been a major problem for many years. However, the revelation that feeds themselves may be sources of contamination, makes the anti-*Salmonella* properties of a feed additive an important feature.[1,4] In fact, the feed used in this experiment was found to contain *S. thomasville*, *S. cubana*, and *S. meleagridis*. The latter was isolated from chicks that died during the 1st week of the experiment.

Summary and Conclusions

A coccidiostat commercially used as a feed additive, consisting of 0.0011% furazolidone and 0.0055% nitrofurazone, reduced morbidity and mortality in chicks exposed to chicks inoculated with *Salmonella pullorum*.

A control feed additive, nicarbazin, had little or no activity against *S. pullorum* infection.

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The Corporate Practice of Veterinary Medicine

Don A. Jensen, B.A.

THE BUSINESS structure of the practice of veterinary medicine, like that of the practices of medicine, dentistry, and law, has changed insignificantly in a period when business has turned largely to the corporate form of organization. Through the years distinguished professional achievements have been effected, the veterinarian has tended toward greater specialization, and the size of veterinary partnerships has generally increased. However, the business management of veterinary practices has remained for the most part in the form of individual proprietorships or partnerships. This is not necessarily because the veterinarian has failed to see the advantages of incorporating his practice. While the law has generally been uncooperative with attempts to incorporate legal, medical, and dental practices,[1] the illegality of a corporate veterinary practice is not as well settled. Several reasons exist which may make the corporate structure a desirable form in which to practice veterinary medicine.

I. Advantages of the Corporate Structure

A) In General.—A corporation is considered for most purposes a legal person; it possesses the rights and duties which attach to that status.[2] Of great significance is the fact that the life of this entity is not dependent upon the life of any natural person.[3] A corporation may be endowed with perpetual existence or organized for a limited period.[4] The ability to organize with perpetual existence or for an extended period might be an important factor to a veterinary practice since this would permit the development of a permanent and enduring reputation.

When there is need for a large amount of capital to carry on an enterprise, the corporate structure possesses marked advantages. Municipalities and charitable groups have frequently constructed hospitals for the purpose of serving the public. It can readily be seen that municipalities and charitable groups will be less likely to build veterinary clinics or hospitals. A veterinarian in many cases does not have adequate capital singly to build a clinic. In many regions veterinarians are too far separated to operate a joint practice as a partnership. The corporate organization might be employed advantageously in establishing regional clinics for the use of all veterinarians in a particular area.

Limitation of personal liability under the corporate structure is an important factor to business ventures. Seemingly, it is also a factor which would appeal to professional practitioners. However, in the past public policy has prohibited the professional practitioner from wrapping the corporate veil of immunity around himself for the purpose of avoiding personal liability for professional torts.[5]

The free transferability of shares is a great advantage to most corporate ventures. When a stockholder desires to liquidate his interest in a business, he can sell his shares without affecting business continuity.[6] Ease of transferring shares, however, is the basis of one of the objections to the corporate practice of a profession. A concern of the courts has been that stock would reach the hands of laymen who would then have both a voice in the practice of a profession and a share in the profits.[7]

Separation of ownership and management is inevitable in the large corporation. It is not a characteristic of the small closely held corporation. In the small business it is quite conceivable that very little actual change in management would result from

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incorporation. It has been suggested, however, that a professional practitioner might be able to perform to a higher degree of proficiency if he were relieved of burdensome financial and management details.[8]

B) Tax Considerations.—Probably the most important consideration in determining the form under which to operate an enterprise is the tax factor. There are several tax distinctions between the partnership and the corporation. Income of a partnership is taxed as the income of the individual partners, whether it is distributed or not.[9] Consequently, all partnership income is taxed at the personal income rate.[10] A corporation's income may be subject to double taxation—corporate income tax and personal income tax when dividends are distributed.[11] All ordinary and necessary expenses of a corporation, including reasonable salaries for personal services actually performed, are allowed as deductions from taxable corporate income.[12] As a result, the burden of double taxation is not placed on salaries to corporate employees—regardless of the fact that the employees may be stockholders. Similarly, a corporation may deduct from gross income amounts paid as rental[13] and as interest.[14] Corporate earnings can be used for expansion and other corporate purposes without being subjected to personal income tax. However, earnings amassed by the corporation for the purpose of avoiding personal income taxation are subject to an accumulation tax.[15] A veterinary practice with high income and a resulting high personal income tax might well realize a tax savings by incorporating. However, a careful analysis of all factors and variables would be required before it could be determined whether it would be advantageous from a tax standpoint to incorporate any particular veterinary practice.

The deferred compensation provisions of the Internal Revenue Code are particularly adaptable to a corporate structure. Employers are authorized to set up tax-exempt deferred compensation plans for their employees.[16] A deferred compensation plan allows an employer to make tax-deductible contributions to a trust established for the benefit of its employees.[71] The employee-beneficiary of the trust is not taxed on this fund until the year in which the fund is distributed or made available to him.[18] In order to qualify for this favorable tax treatment, the deferred compensation plan must benefit a specified per cent of all employees eligible to benefit under the plan. Further, it must not discriminate in favor of "employees who are officers, shareholders, persons whose principal duties consist in supervising the work of other employees, or highly compensated employees."[19] In effect, deferred compensation plans allow a portion of an employee's income during his productive high income years to be deferred to the low income retirement years with a resulting tax advantage. As self-employed individuals, veterinarians practicing individually or as a partnership cannot establish deferred compensation plans for their own benefit. Under the corporate structure, a veterinarian would be an employee of the corporation and thus would qualify for deferred compensation benefits. Although deferral of personal income is probably the main incentive for veterinarians to incorporate,[20] several similar advantages have been noted.[21] Reasonable premiums for insurance on the life of an *employee* are deductible as a business expense if the premiums are in the nature of additional compensation and the employer is not directly or indirectly a beneficiary under the policy.[22] Similarly, taxes paid by *employers* under the Federal Insurance Contributions Act are deductible as business expenses where the tax is paid on wages which are deductible as business expenses.[23] Obviously, the employer-employee relationship must exist before either of these deductions will be available.

Congress has had several proposals before it which would make the self-employed person eligible for a deferred compensation plan. Such legislation passed the House during the 85th Congress in the form of the Jenkins-Keogh Bill.[24] This bill died in the Senate. Again in the 86th Congress, the House passed a similar bill which met the same fate.[25] This legislation would have provided the self-employed person the opportunity to defer personal income without the necessity of incorporating. The American Veterinary Medical Association was among the many groups supporting this legislation.[26] The unhappy fate of these bills probably was due to the fear of reduced government revenue resulting from the tax advantages that would be gained by self-employed taxpayers.[27] These bills would not have given the self-employed person preferential treatment; they would only have given him some of the tax

benefits available to the corporate employee. The failure of this legislation leaves the problem to the imagination of those concerned to adapt their business organizations to the tax structure.[28]

If veterinarians are able to overcome the hurdle of the prohibition against professional corporations, the provisions of subchapter S of the Internal Revenue Code may provide a further tax advantage.[29] Under these provisions, a "small business corporation" may elect to have its income taxed to the shareholders in a manner somewhat similar to the taxation of partners.[30] To be eligible for this election the corporation must not: (1) have more than ten shareholders; (2) have anyone other than individuals or estates as shareholders; (3) have a nonresident alien as a shareholder; nor (4) have more than one class of stock.[31] The effect of election is to regard the taxable income of the corporation as income to the shareholders, to be taxed at the personal tax rate. This election does not eliminate the "small business corporation's" opportunity to deduct contributions for employee fringe benefits, such as pension and profit sharing plans.[32] Thus, the subchapter S concept would allow a veterinary corporation to be taxed as a partnership where this was desirable without the loss of deferred compensation benefits.[33]

If a veterinary practice is taxed as a corporation, a further consideration is whether it would be considered a personal holding company and thus subjected to high taxation on undistributed earnings.[34] To be classified as a personal holding company, at least eighty per cent of a corporation's gross income must consist of "personal holding company income" as defined in section 543 of the Internal Revenue Code.[35] "Personal holding company income" includes "[a]mounts received under a contract under which the corporation is to furnish personal services; if some person other than the corporation has the right to designate (by name or by description) the individual who is to perform the services, or if the individual who is to perform the services is designated (by name or by description) in the contract . . . ."[36] A widely held corporation is not affected because to fall under these provisions fifty per cent or more of the outstanding stock must be owned, directly or indirectly, by not more than five individuals.[37] In addition, income from a particular personal service contract is included within "personal holding company income" only if at some time during the taxable year twenty-five per cent or more of the corporation's stock is owned, directly or indirectly, by the individual who performs the services under that contract.[38] A substantial portion of the income of a corporate veterinary practice would, of course, be derived from personal services. It seems that the personal holding company provisions would apply to veterinary corporations and to veterinary associations taxed as corporations if clients chose specific veterinarians to serve them or if the veterinarian were designated in the contract of employment. This pitfall could be avoided by reserving to the corporation or to the practitioners the right to assign veterinarians to the corporation's clients. The one man corporation would appear vulnerable to attack as a personal holding company since it would be difficult to urge that the client does not have the right to designate the individual who is to perform the services.[39] However, professional corporations and associations were not the object of the personal holding company provisions,[40] and no known application of these provisions has been made to professional groups although the opportunity to raise the issue has been presented.[41]

II. The Prohibition Against the Professional Corporation

A) The Licensing Statutes.—Most courts expound the rule that a corporation cannot be licensed to practice a profession.[42] Some jurisdictions have general provisions in their corporation acts that prohibit a corporate professional practice.[43] Not only does the rule bar a corporation itself from securing a license to practice a profession, but also it prohibits a corporation from hiring licensed practitioners to practice a profession for it. In this simple form the rule does not afford a clear image of the law. The question of what endeavors are to be labeled as professions is apparent at the outset. Adjudications concerning the legal, medical, and dental professions have been numerous, but there is little authority considering the corporate practice of veterinary medicine. The legality of the corporate veterinary practice is therefore unsettled in most jurisdictions.[44]

The states have assumed control over the licensing of veterinarians.[45] Similarly, state legislatures have adopted licensing statutes which require individuals to hold a state license before engaging in the practices of law,[46] medicine,[47] dentistry,[48] pharmacy,[49] optometry,[50] barbering,[51] cosmetology,[52] and several other endeavors.[53] The validity of licensing regulation has been upheld in the courts.[54] However, the power of state licensing boards is not complete since arbitrary action will be struck down by the courts.[55] The existence of a licensing statute means only that the legislature is exercising authority over the entrance into an occupation. This control by itself does not create the professional status necessary to apply the rule against the corporate practice of a profession.[56] It is clear that the courts will include the practices of law,[57] medicine,[58] and dentistry[59] in the prohibition of a corporate professional practice. Beyond these areas the law is not so well settled.[60]

A recent opinion of the Attorney General of the State of Washington advised that a group of licensed veterinarians cannot form a corporation for the purpose of carrying on the practice of veterinary medicine.[61] The opinion stressed that "Human personal qualifications for such professions cannot be possessed by a corporation."[62] It is to be noted that the Washington Legislature has referred to veterinary medicine as a profession.[63] It has likewise been indicated in Iowa that the practice of veterinary medicine is not a legal purpose for which a corporation may be organized.[64] Apparently it is not necessary for the legislatures to treat all professions in a similar maner.[65] The courts at times have referred to the *learned* professions as those which cannot practice as a corporation.[66] This fails to remove the uncertainty in the absence of a more precise definition, but one court has indicated that the learned professions include only law, medicine, and theology.[67]

The licensing statutes require "persons" to be licensed before engaging in the performance of certain personal services.[68] The Washington Attorney General spoke of the personal qualifications necessary for licensure which a corporation is not capable of possessing.[69] This is consistent with the view that includes a corporation in the definition of a "person" but then relies upon the theory that a corporation cannot possess the personal qualifications necessary for licensure.[70] The Washington opinion noted specifically the impossibility of a corporation graduating from an approved veterinary school, reaching twenty-one years of age, being of good moral character, and passing an examination given by the Veterinary Board of Governors.[71] Other jurisdictions have reached the same result by a similar reasoning process. These courts concluded that a corporation is not a "person" within the meaning of the licensing acts and therefore cannot qualify under the statute.[72] The result of each of these statutory interpretations is to make the corporate practice of a profession illegal per se. A related reason for the interdiction against the corporate professional practice is that a corporation cannot be suspended or disbarred.[73] However, taking the view that only individuals are capable of being licensed, it follows that there would be no reason to suspend or disbar the corporation —only the licensed agents of the corporation. If a corporation cannot possess the personal qualities necessary for licensure, it cannot perform acts which would demand suspension.

One court has said: "The *person* who practices medicine, that is, who undertakes to judge the nature of disease, or to determine the proper remedy therefor, or to apply the remedy, must have the necessary qualifications and obtain license."[74] This theory stresses that a corporation would need no license—only the practicing agents. Therefore, a corporation could employ licensed practitioners since it is the human element that must perform professional services.[75] Akin to the view that only actual *human* practitioners need a license is the argument that the relationship of practitioner to his employer under the corporate structure is that of an independent contractor.[76] If the professional practitioner is viewed as an independent contractor there is, of course, no question of the corporation practicing a profession. Again, the corporation could perform the duties of administration and financial management.[77] The literal interpretations of the licensing statutes made by most courts seem to be unrealistic approaches employed as a means of reaching a predetermined result. Their effect is to prohibit corporate professional practices without reference to the public policy considerations which are the real basis of the prohibition. However, an in-

terpretation of the licensing statutes which would allow a corporation to employ licensed practitioners or would view the licensed practitioner as an independent contractor would, in effect, completely eliminate the rule that a corporation cannot practice a profession. As a result, this type of reasoning has not gained wide-spread acceptance in the courts.

B) Public Policy Objections to the Professional Corporation.—Although the courts generally rely on the licensing statutes to deny professional personnel the right to incorporate, the underlying influence is based upon public policy considerations. An objection to the corporate practice of a profession has been that the relationship of the practitioner and his client is based upon trust and confidence and is necessarily personal in nature. A corporation is said to interfere with such a relationship.[78] This fear of the corporate professional practice develops from the idea that the practitioner would owe his first duty to the corporation, as his employer, rather than to his client.

Another common policy objection to professional corporations is based on the fear of unlicensed laymen profiting as shareholders of the corporation. It is thought to be undesirable to put a professional practice under the control of unlicensed personnel and thus enable them to exploit commercially the practice of a profession.[79] Another fear stems from the possibility of unscrupulous practitioners seeking the corporate shelter for their exploitative acts. Public policy demands that the professional man be held to unlimited liability for his torts.[80]

C) The Role of Professional Ethics.—Quite aside from the legal problems, professional ethics play a role in the governing of practitioners of the various professions. Professional standards of ethics have tended to repel efforts of professional men to incorporate. However, efforts by professional groups to enforce standards may encounter legal obstacles. In *American Medical Ass'n v. United States,*[81] the Supreme Court held that acts to restrain a group health plan by the American Medical Association were violative of section three of the Sherman Act. The Association had coerced its members to refuse employment under the plan and had urged that they not consult with physicians who were employed by the health group. The Court found that the health group was engaged in "trade" as used in the Sherman Act and found the Association guilty of restraining trade or commerce.[82]

The American Institute of Accountants forbids its members to practice in the form of a corporation.[83] Several states have specifically provided by statute, however, that it is lawful for accountants to practice as a corporation.[84] The American Veterinary Medical Association has taken no official position on the incorporation of members of the veterinary medical profession. The Association has objected, however, to the employment of veterinarians by a corporation formed by laymen and rendering veterinary services, and, in the opinion of its Executive Secretary, most of the member practitioners "feel it would not be professional for members to practice as a corporation."[85]

D) Exceptions to the General Prohibition.—Some professional practices have escaped the prohibition on incorporation. The excepted area, however, is quite ill-defined. It seems that an arm of the government may practice medicine without fear of legal sanction.[86] Included as exemptions to the prohibition, because of public policy desirability, is the practice of medicine by medical schools[87] and the practice of law by legal aid societies.[88] The privilege is usually extended to provide that non-profit corporations may employ licensed physicians to carry on the practice of medicine.[89] Despite the existence of the corporate "middleman" the courts distinguish this arrangement from the intervention of a corporation in a professional practice for the purpose of commercial exploitation.

Allied with the approval of the corporate practice of medicine by non-profit corporations is the gaining popularity of group health plans.[90] Public policy in favor of such programs seems to be gaining the upper hand.[91] Group health plans do not fall into the category of health insurance. Health insurance plans provide only for medical care of a curative nature and fees are paid to physicians for actual services rendered.[92] Medical care of a comprehensive nature, including both cure and prevention, is provided under group health plans. Group health plans are usually organized as non-profit corporations providing medical services to their members who make periodic

payments in advance. The medical services are rendered by doctors who are hired at a fixed rate in order to make expenses for the program budgetable. The plans are usually subscribed to on a voluntary basis although they may be supported by the participation of a labor organization or similar cohesive group. The social desirability of a solution to rising medical costs has undoubtedly been a big factor in the judicial acceptance of group health plans. Health plans incorporated by individuals for a profit, however, have been invalidated.[93] There is an additional danger facing group health plans. If they are declared to be in the insurance business, they must comply with stringent insurance laws. Group health plans have thus far avoided this burden.[94]

The exemption might quite logically be applied to veterinary medicine. An organization could set up a plan in the form of a non-profit corporation to furnish veterinary services to subscribers of the program. Subscribers would make periodic pre-payments on the basis of their potential veterinary needs. Veterinarians would receive compensation from the corporation, either at a fixed salary or based on the services performed.

III. Incorporating the Veterinary Practice

Traditionally, public policy considerations have stood as the most significant barrier against the professional corporation. From the standpoint of the veterinarian, two possibilities exist for the promotion of a corporation formed to render veterinary services. First, there is the possibility of distinguishing veterinary medicine from the professions which have the prohibition well established. Secondly, if this distinction is not realized, a special type of corporation could be authorized by statute which would meet all of the public policy objections to a professional corporation.

The concern for the personal and confidential relationship between practitioner and client in the legal profession and practitioner and patient in the medical profession is not applicable to the veterinary medical profession.[95] By the very nature of the services to and for persons by physicians and lawyers, a confidential relationship is mandatory. This same need for confidential relations is not present in the veterinary medical profession. No personal secrets need be revealed to the veterinarian in order for him to render his services effectively. This distinction seems to go to the very core of the prohibition against corporate professional practices. Without the social need for a personal and confidential relationship, the rule loses a sturdy pillar of support and, as a result, might fail to stand in regard to veterinarians.

If the prohibition against corporate professional practices is found applicable to the veterinarian, another possibility is still available. A unique corporation could be formed pursuant to general statutory authorization which would remove the objections to a corporate professional practice in its articles of incorporation.[96] The states exert adequate control over both professional practices and corporations to enable them to produce and regulate such a corporate creature.[97]

The waiver of limited liability could be easily effected by a provision in the articles. All of the stockholders of this corporation would necessarily be licensed veterinarians. Provisions should be set forth in the articles to permit sale of stock to licensed veterinarians only. Provisions should also be made requiring the remaining stockholders or the corporation to purchase the stock of a decedent stockholder to prevent the stock from falling into the hands of laymen by inheritance or bequest. All the stockholders would then be subject to both the jurisdiction of the state licensing boards and the code of ethics of the veterinary profession. The corporation would likewise be subject to state control under the corporation laws. Personal and confidential relations with clients could be maintained insofar as necessary, while the corporate management could handle the details of financing, maintain the facilities, and perform other general management functions. Some of the advantages of the corporate structure would be lost, but some of the most beneficial would remain.[98] The most important of the retained benefits would be the opportunity for the veterinarian to take advantage of a deferred income plan. The organization would, of course, be taxed as a corporation unless it elected to be taxed under the provisions of subchapter S.

With the removal of the public policy objections to a corporate professional prac-

tice under statutory authorization, there should be no reason to prohibit the veterinarian from taking advantage of the corporate structure as other business enterprises have long been permitted to do. The courts have recognized that private business should be restricted only if there is a threat to the public welfare.[99]

IV. Incorporation of Facilities of the Veterinary Practice

Apart from incorporating the veterinary practice, it may serve to the advantage of veterinarians to incorporate their physical facilities. There is no problem of the corporate practice of a profession when only physical facilities are incorporated. Under this arrangement the corporation would own the building and equipment and rent them to the veterinarians. Permanent physical facilities would inculcate in clientele the habit of frequenting a specific location although the practicing veterinarians might change. Shares of stock could be readily transferred because there is no question of the corporation illegally practicing veterinary medicine. Capital might be more readily obtainable since there appears to be no objection to laymen as well as practitioners owning an interest in the real estate or other physical property used in a professional practice. This type of corporate structure would also provide limited liability to stockholders for torts committed by nonprofessional employees of the clinic. This would not remove the veterinarian's personal liability for malpractice or for injuries caused by defective equipment used in the professional practice. Nor could the veterinarian provide for deferral of his personal compensation by incorporation of physical facilities. However, it might well prove to be of practical benefit to the veterinarian to take advantage of such a structure since rural veterinarians could establish regional clinics under this system and thereby provide facilities which would otherwise be unavailable to the independent practitioner.

V. Securing Tax Advantages Without Incorporating—The Unincorporated Association

A relatively recent development has created the possibility that professional groups may be able to secure corporate tax advantages without the necessity of incorporation. The unincorporated association gained its significance for professional groups following the 1954 case of *United States v. Kintner*.[100] In that case, a group of physicians organized into a form similar to a joint stock company and set up a pension trust for employees and members of the association. The Internal Revenue Code provides that associations will be taxed as corporations even though they are recognized as partnerships under state law.[101] The test to be applied in determining whether such an association qualifies to be taxed as a corporation was spelled out in *Morrissey v. Commissioner*.[102] The Supreme Court established a resemblance test based on five corporate characteristics.[103] The conclusion reached by the district court in the *Kintner* case was that the association more closely resembled a corporation than a partnership and therefore could be taxed as a corporation.[104] The court of appeals affirmed.[105] This represented a substantial breakthrough for the professional practice in enabling it to create plans for deferral of income through exempt employee trusts. Indeed, such an association is often referred to as a *Kintner* group. It is interesting to note that a Texas district court, apparently unaware of the *Kintner* decision, reached the same result with the court making its determination on the basis of "elementary principles of justice."[106]

A test similar to the one set out in the *Morrissey* case is incorporated into recently adopted income tax regulations. Any future litigation of this problem will thus turn on the question of whether the association involved satisfies the tests established in the new regulations. The characteristics recognized by the regulations as traits of a "pure" corporation are: (1) associates, (2) an objective to carry on business and divide the gains therefrom, (3) continuity of life, (4) centralization of management, (5) liability for corporate debts limited to corporate property, and (6) free transferability of interests.[107] An organization will be taxed as a corporation if "the corporate characteristics are such that the organization more nearly resembles a corporation than a partnership or trust."[108] An unincorporated organization cannot be taxed as an association unless it has more corporate

characteristics than noncorporate characteristics.[109]

Uncertainty results in the interpretation to be given the regulations in regard to the effect of local law. The classification under which a business operates under state law is not determinative of classification for taxation under the Internal Revenue Code.[110] However, "local law governs in determining whether the legal relationships which have been established in the formation of an organization are such that the standards are met."[111] This raises the question of whether an organization termed a partnership by state law could possess enough "corporate characteristics" to be taxed as an association.

A professional organization could certainly qualify as having associates and an objective to carry on a business and divide the gains therefrom. Because of the public policy factors involved, it seems equally clear that the associates could not achieve limited liability.[112] Centralized management apparently could not be a trait of an organization recognized as a partnership under state law. The regulations provide that centralized management does not exist unless the managers have the *sole* authority to make management decisions.[113] Even though partners can agree *inter se* to vest all management control in a few of the partners, any partner can still bind the partnership by contracting with an outsider who has no notice of the agreement.[114]

Thus, in order for a professional group to have corporate characteristics predominate, it will be necessary for the group to have both continuity of life and free transferability of interests. If a technical dissolution results upon the death, insanity, bankruptcy, retirement, resignation, or expulsion of a member, as is generally the case under state partnership law,[115] continuity of life cannot be achieved. It has been urged, however, that some jurisdictions have, by judicial decision, modified the general rule so that dissolution is effected by the aforesaid methods of a partner's withdrawal only if the partnership agreement does not provide for the continuation of the organization.[116] In these jurisdictions, continuity of life within the meaning of the regulations presumably could be achieved. The regulations also provide that the corporate characteristic of free transferability of interests does not exist unless all members can, without the consent of other members, transfer all the attributes of their interest in the organization, including the right to participate in management.[117] Defined in this manner, the professional organization obviously could not achieve free transferability of interests.[118] In addition, free transferability does not exist if such transfer results in a technical dissolution.[119] The regulations do, however, recognize a "modified form" of free transferability if a member can transfer his interest only after having offered such interest to the other members at its fair market value.[120] The effect of this provision is not clear since it is further provided that "the presence of this modified corporate characteristic will be accorded less significance than if such characteristic were present in an unmodified form."[121] Further, it seems that a professional corporation could not obtain even this modified form of free transferability since public policy prohibits transfer of an interest in a professional practice to a layman under any circumstances.

Thus, the definitions of "corporate characteristics" provided by the new regulations seem to prevent a professional group from qualifying as an association. One of the seven examples given to illustrate the application of the definitions hypothesizes a group of doctors which is classified as an association.[122] The example, however, assumes the characteristics of centralized management, continuity of life, and a modified form of free transferability of interests valid under state law. As previously noted, it may be impossible, as a practical matter, to achieve these characteristics in a professional organization.[123]

VI. Conclusion

The rule prohibiting the corporate professional practice was created in the past. It emerged when taxes were not a significant consideration in business management. With the appearance of steeply graduated personal income tax rates and subsequent exemptions for employee deferred compensation plans an inequity has developed in the tax structure. Deferral of income seems highly appropriate to the veterinary practitioner. As a result of extra years of professional education, the veteri-

narian commences his productive life late. He may have a relatively low income in his early years of practice while establishing his practice and gaining experience. This is followed by higher income years which, due to the late start, are relatively short.

A reconcilation between the public policy evils of the professional corporation and the desire of the professional practitioner to defer a portion of his income to his retirement years is highly desirable. If the evils associated with corporate practice are removed, the prohibition should not apply. The obvious solution to the professional man's dilemma would seem to be the authorization by statute of a special type of professional corporation which obviates the traditional public policy objections to a corporate professional practice. In lieu of this type of state legislation, the professional man's desire for tax equality seems to be temporarily thwarted. Since the new regulations concerning the taxation of associations offer little promise to professional groups, the best chance for relief from the present tax structure probably lies in urging enactment of legislation similar in form to the recently defeated Jenkins-Keogh bills.

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[1]See, *e.g.*, People *ex rel.* Kerner v. United Medical Serv., Inc., 362 Ill. 442, 200 N.E. 157 (1936) (medicine); People *ex rel.* Ill. State Bar Ass'n v. Peoples Stock Yards State Bank, 344 Ill. 462, 176 N.E. 901 (1931) (law); State v. Bailey Dental Co., 211 Iowa 781, 234 N.W. 260 (1931) (dentistry).

[2]See generally DEWEY, *The Historic Background of Corporate Legal Personality*, 35 YALE L.J., 655 (1926).

[3]1 OLECK, MODERN CORPORATION LAW § 519 (1958).

[4]*E.g.*, DEL. CODE ANN. tit. 8, § 102(a) (6). (1953); MD. ANN. CODE art. 23, § 9(a)(1) (1957); UTAH CODE ANN. § 16-2-5(3) (Supp. 1959); Iowa Acts, 58 G.A. ch. 321, § 49(2) (1959).

[5]See note 80 *infra* and accompanying text.

[6]BALLANTINE, CORPORATIONS § 1, at 3 (rev. ed. 1946).

[7]See note 79 *infra* and accompanying text.

[8]Note, *Right of Corporation to Practice Medicine*, 48 YALE L.J. 346, 350 (1938).

[9]INT. REV. CODE OF 1954, §§ 701, 702.

[10]The personal income tax rate is graduated from 20% to 97%. INT. REV. CODE OF 1954, § 1.

[11]Corporate income is subject to "normal tax" and an additional "surtax." For a taxable year beginning before July 1, 1961, the normal tax is equal to 30% of the taxable income. For a taxable year beginning after June 30, 1961, the normal tax is equal to 25% of the taxable income. INT. REV. CODE OF 1954, § 11(b). This provision originally provided that the reduced normal tax would begin for a taxable year beginning after March 31, 1955. Since then annual amendments have kept the reduced rate from taking effect. The "surtax" is assessed at the rate of 22% of the amount by which the taxable income exceeds $25,000. INT. REV. CODE OF 1954, § 11(c).

[12]INT. REV. CODE OF 1954, § 162(a)(1).

[13]INT. REV. CODE OF 1954, § 162(a)(3).

[14]INT. REV. CODE OF 1954, § 163.

[15]INT. REV. CODE OF 1954, §§ 531-37. "Accumulated taxable income" is taxed at the rate of 27½% for sums not in excess of $100,000 and 38½% for sums in excess of $100,000. INT. REV. CODE OF 1954, § 531. However, a credit is allowed in computing "accumulated taxable income." This credit is the greater of (1) the earnings retained for the reasonable needs of the business, or (2) the amount by which $100,000 exceeds the accumulated earnings of the corporation at the close of the preceding tax year. The effect of this provision is to exempt corporations which have not accumulated earnings to the extent of $100,000 from the imposition of the penalty tax without reference to the reasonableness of the accumulation. INT. REV. CODE OF 1954, § 535 (c). See Polasky, *Planning for the Disposition of a Substantial Interest in a Closely Held Business* (pt. 3), 46 IOWA L. REV. 516, 544-45 & n.114 (1961).

[16]INT. REV. CODE OF 1954, §§ 401-04.

[17]INT. REV. CODE OF 1954, § 404(a).

[18]INT. REV. CODE OF 1954, § 402(a).

[19]INT. REV. CODE OF 1954, § 401(a)(3).

[20]See Winkleman, *Pension and Other Deferred Compensation for the Professional Man*, 4 TAX COUNSELOR'S Q. 155 (1960); Wormser, *A Plea for Professional Incorporation Laws*, 46 A.B.A.J. 755 (1960).

[21]See Maier & Wild, *Taxation of Professional Firms as Corporations*, 44 MARQ. L. REV. 127, 128 (1960)

[22]INT. REV. CODE OF 1954, § 264; Treas. Reg. § 1.264-1 (1957).

[23]See 2 CCH 1961 STAND. FED. TAX REP. ¶ 1449, 725.

[24]H.R. 10, 85th Cong., 2d Sess. (1958).

[25]H.R. 10, 86th Cong., 1st Sess. (1959).

[26]105 CONG. REC. 4265 (1959).

[27]See Winkleman, *supra* note 20, at 165.

[28]One device employed is the "Kintner" type unincorporated association. See text accompanying notes 100-23 *infra*.

[29]For a discussion of these provisions, see Note, *The Subchapter S Corporation: A New Tax Concept*, 45 IOWA L. REV. 575 (1960).

[30]INT. REV. CODE OF 1954, §§ 1371-77.

[31]INT. REV. CODE OF 1954, § 1371(a).

[32]Note, *The Subchapter S Corporation: A New Tax Concept*, 45 IOWA L. REV. 575, 584 (1960). For a complete discussion of the effect of electing to be taxed as a subchapter S corporation, see *id.* at 583-90. A bill was introduced in the eighty-sixth Congress which would have eliminated employee benefits for shareholders of a subchapter S corporation. H.R. 9003, 86th Cong., 1st Sess. (1959).

[33]Conversely, certain unincorporated enterprises may presently elect to be taxed as a corporation under section 1361 of the Internal Revenue Code. However, a partner or proprietor of such a business is not considered an employee for the purpose of establishing exempt fringe-benefit programs. INT. REV. CODE OF 1954, § 1361 (d). Moreover, a veterinary practice could not meet the requirements necessary to qualify for this election. One of the requirements is that:

> [S]uch enterprise is one in which capital is a material income producing factor, or 50 per

cent or more of the gross income of such enterprise consists of gains, profits, or income derived from trading as a principal or from buying and selling real property, stock, securities, or commodities for the account of others. INT. REV. CODE OF 1954, § 1361(b)(4).

[34]INT. REV. CODE OF 1954, §§ 541-47. The tax on undistributed "personal holding company income" is 75% of the first $2,000, plus 85% of amounts in excess of $2,000. INT. REV. CODE OF 1954, § 541.

[35]INT. REV. CODE OF 1954, § 542(a)(1).

[36]INT. REV. CODE OF 1954, § 543(a)(5)(A).

[37]INT. REV. CODE OF 1954, § 542(a)(2). Section 544 states certain rules for determining stock ownership.

[38]INT. REV. CODE OF 1954, § 543(a) (5).

[39]See Jones, *The Professional Corporation*, 27 FORDHAM L. REV. 353, 367 (1958).

[40]The provisions were drafted to penalize entities set up to benefit individuals with unique talents, such as actors and cartoonists. *Id.* at 368.

[41]In United States v. Kintner, 216 F.2d 418 (9th Cir. 1954), 40 IOWA L. REV. 663 (1955), a group of physicians formed an unincorporated association qualified to be taxed as a corporation. They were therefore subject to possible taxation as a personal holding company. The government did not raise the issue even though the association had established a reserve fund from undistributed income. See Kintner v. United States, 107 F. Supp. 976, 977 (D. Mont. 1952).

[42]*E.g.*, People v. Painless Parker Dentist, 85 Colo. 304, 275 Pac. 928 (1929) (dentistry); People *ex rel.* Ill. State Bar Ass'n v. Peoples Stock Yards State Bank, 344 Ill. 462, 176 N.E. 901 (1931) (law); State *ex rel.* Sisemore v. Standard Optical Co., 182 Ore. 452, 188 P.2d 309 (1947) (optometry).

[43]In setting out the purpose or purposes for which a corporation may be organized, some states provide for an exception in the case of the practice of a profession. HAWAII REV. LAWS § 172-1 (1955) ("for any purpose . . . other than for the purpose of carrying on any profession"); IDAHO CODE ANN. § 30-102 (1948) ("for any lawful business purposes except: 1. For the carrying on or practice of any profession"); KAN. GEN. STAT. ANN. § 17-2701 (1949) ("any lawful business . . . other than the practice of a learned profession"); LA. REV. STAT. § 12:2 (1950) ("for any lawful business purposes, except . . . practicing law"); N.Y. STOCK CORP. LAW § 7 ("No corporation shall be organized . . . for any purpose . . . of conducting any branch of the practice of law"); OHIO REV. CODE ANN. § 1701.03 (Page Supp. 1960) ("for any purpose or purposes, other than for carrying on the practice of any profession"); S.D. CODE § 11.0201 (1939) ("for any lawful business . . . which by reason of its nature and regulation is not required to be conducted personally by a natural person or persons.")

[44]A corporation exists in Iowa which lists as one of its purposes: "To perform any and all duties customarily practiced by doctors of veterinary medicine." Letter from the director of the corporation section of the office of the Secretary of State of Iowa, December 12, 1960, on file in *Iowa Law Review* office.

[45]All states except Alaska have licensing statutes for veterinarians. ALA. CODE tit. 46, §§ 312-29 (1958); ARIZ. REV. STAT. ANN. §§ 32-2201 to -2244 (1956); ARK. STAT. ANN. §§ 72-1101 to -1116 (1957); CAL. BUS. & PROF. CODE §§ 4800-905; COLO. REV. STAT. ANN. §§ 144-1-1 to -11 (1953, Supp. 1957); CONN. GEN. STAT. REV. §§ 20-196 to -206 (1958, Supp. 1959); DEL. CODE ANN. tit. 24, §§ 3301-13 (1953, Supp. 1960); FLA. STAT. §§ 474.01-.13 (1959); GA. CODE ANN. §§ 84-1501 to -1513 (1955, Supp. 1958); HAWAII REV. LAWS §§ 73-1 to -13 (1955, Supp. 1957); IDAHO CODE ANN. §§ 54-2101 to -2121 (1957); ILL. REV. STAT. ch. 91, §§ 114-24 (1959); IND. ANN. STAT. §§ 16-1431 to -1456 (Supp. 1960); IOWA CODE §§ 169.1-.48 (1958), as amended, Iowa Acts, 58 G.A. ch. 74, § 11 (1959); KAN. GEN. STAT. ANN. §§ 47-801 to -812 (1949); KY. REV. STAT. §§ 321.180-.990 (1959); LA. REV. STAT. §§ 37:1511-:1530 (1950, Supp. 1952); ME. REV. STAT. ANN. ch. 77, §§ 1-7 (1954, Supp. 1959); MD. ANN. CODE art. 43, §§ 150-57 (1957); MASS. ANN. LAWS ch. 112, §§ 54-60 (1957, Supp. 1959); MINN. STAT. §§ 156.01-.14 (1957); MISS. CODE ANN. §§ 8914-01 to -13 (1956); MONT. REV. CODES ANN. §§ 66-2201 to -2212 (1953, Supp. 1959); NEB. REV. STAT. §§ 71-1,148 to -1,152 (Supp. 1959); NEV. REV. STAT. §§ 638.010-.170 (1957), as amended Nev. Stat. 1960, ch. 237; N.H. REV. STAT. ANN. §§ 332:1-:17 (1955, Supp. 1959); N.J. STAT. ANN. §§ 45:16-1 to -11 (1940, Supp. 1960); N.M. STAT. ANN. §§ 67-11-1 to -11 (1953); N.Y. EDUC. LAW §§ 6701-14; N.C. GEN. STAT. §§ 90-179 to -187 (1958, Supp. 1959); N.D. CODE ANN. §§ 36-02-01 to -02-12 (1960); OHIO REV. CODE ANN. §§ 4741.01-.99 (Page Supp. 1960); OKLA. STAT. tit. 59, §§ 676-97 (1951, Supp. 1959); ORE. REV. STAT. §§ 686.010-.990 (1953); PA. STAT. ANN. tit. 63, §§ 506-1 to -11 (1959, Supp. 1960); R.I. GEN. LAWS ANN. §§ 5-21-1 to -13 (1956, Supp. 1960); S.C. CODE §§ 56-1551 to -1567 (1952); S.D. CODE §§ 40-0201 to -0207 (1939, Supp. 1960); TENN. CODE ANN. §§ 63-1201 to -1222 (1955, Supp. 1960); TEX. REV. STAT. ANN. art. 7465a (1960); UTAH CODE ANN. §§ 58-21-1 to -6 (1953); VT. STAT. ANN. tit. 26, §§ 2351-435 (1959); VA. CODE ANN. §§ 54-776 to -791 (1958, Supp. 1960); WASH. REV. CODE §§ 18.92.010-.900 (Supp. 1959); W. VA. CODE ANN. §§ 2943-49 (1955, Supp. 1960); WIS. STAT. §§ 95.51-54 (1957); WYO. STAT. ANN. §§ 33-369 to -383 (1957; Mich. Pub. Acts 1956, No. 152; Mo. Laws 1953, at 605-13.

[46]*E.g.*, IOWA CODE §§ 610.1-38 (1958); VA. CODE ANN. §§ 54-42 to -83.1 (1958, Supp. 1960).

[47]*E.g.*, ARIZ. REV. STAT. §§ 32-1401 to -1456 (1956, Supp. 1960); IOWA CODE §§ 148.1-.9 (1958); N.C. GEN. STAT. §§ 90-1 to -21 (1958).

[48]*E.g.*, IOWA CODE §§ 153.1-.26 (1958); N.Y. EDUC. LAW §§ 6601-16; TENN. CODE ANN. §§ 63-530 to -558 (Supp. 1960).

[49]*E.g.*, IDAHO CODE ANN., §§ 54-1701 to -1725 (1957); IOWA CODE §§ 155.1-.28 (1958); OHIO REV. CODE ANN. §§ 4729.01-.99 (Page 1953, Supp. 1960).

[50]*E.g.*, IOWA CODE §§ 154.1-.9 (1958, as amended, Iowa Acts, 58 G.A. ch. 136 (1959); KAN. GEN. STAT. ANN. §§ 65-1501 to -1513 (1949); VT. STAT. ANN. tit. 26, §§ 1601-96 (1959).

[51]*E.g.*, ILL. REV. STAT. ch. 16¾, §§ 14.35-.96 (1959); IOWA CODE §§ 158.1-.12 (1958); N.H. REV. STAT. ANN. §§ 313:1-:22 (1955, Supp. 1959).

[52]*E.g.*, CAL. BUS. & PROF. CODE §§ 7300-16; IOWA CODE §§ 157.1-.15 (1958); MO. REV. STAT. §§ 329.010-.250 (1949).

[53]Included in a complete list would be accountancy, nursing, civil engineering, architecture, chiropody, osteopathy, chiropractics, and funeral directing and embalming.

[54]*E.g.*, Douglas v. Noble, 261 U.S. 165 (1923)

(dentistry); Dent v. West Virginia, 129 U.S. 114 (1889) (medicine); People *ex rel.* Ill. State Bar Ass'n v. Peoples Stock Yards State Bank, 344 Ill. 462, 176 N.E. 901 (1931) (law); Walker v. Corwin, 210 Minn. 337, 300 N.W. 800 (1941) (veterinary medicine).

[55]*E.g.*, York v. State *ex rel.* Schwaid, 152 Fla. 285, 10 So. 2d 813 (1943) (dentistry); Chicago College of Osteopathy v. Puffer, 3 Ill. App. 2d 69, 120 N.E. 2d 672 (1954), *aff'd*, 5 Ill. 2d 441, 126 N.E.2d 26 (1955) (osteopathy); Miller v. Board of Registration of Nurses & Trained Attendents, 336 Mich. 35, 57 N.W.2d 320 (1953) (nursing); *cf.* Kramer v. State Bd. of Veterinary Medical Examiners, 55 So. 2d 93 (La. Ct. App. 1951) (board may not enlarge powers delegated to it by legislature).

[56]See Louis K. Liggett Co. v. Baldridge, 278 U.S. 105 (1928), where the Court recognized the validity of state control over pharmacists but held unconstitutional an act requiring that every drug store be owned only by licensed pharmacists.

[57]Hansen v. Sullivan, 184 Wash. 538, 52 P.2d 895 (1935); *cf.* Detroit Bar Ass'n v. Union Guardian Trust Co., 282 Mich. 216, 276 N.W. 365 (1937) (corporation prohibited from practicing law by statute); In the Matter of Co-op. Law Co., 198 N.Y. 479, 92 N.E. 15 (1910) (same).

[58]*E.g.*, People *ex rel.* State Bd. of Medical Examiners v. Pacific Health Corp., 12 Cal. 2d 156, 82 P.2d 429 (1938), *cert. denied*, 306 U.S. 633 (1939); People *ex rel.* Kerner v. United Medical Serv., Inc., 362 Ill. 442, 200 N.E. 157 (1936); *cf.* Rosane v. Senger, 112 Colo. 363, 149 P.2d 372 (1944) (malpractice action against hospital dismissed since corporation cannot practice medicine). *But cf.* State *ex inf.* Sager v. Lewin, 128 Mo. App. 149, 106 S.W. 581 (1907) (distinction made between corporate practice of medicine and contracting for practice of medicine through licensed physicians in corporation's employ); State Electro-Medical Institute v. State, 74 Neb. 40, 103 N.W. 1078 (1905) (same); State Electro-Medical Institute v. Platner, 74 Neb. 23, 103 N.W. 1079 (1905) (same).

[59]*E.g.*, Painless Parker v. Board of Dental Examiners, 216 Cal. 285, 14 P.2d 67 (1932); People v. Painless Parker Dentist, 85 Colo. 304, 275 Pac. 928 (1929); State v. Bailey Dental Co., 211 Iowa 781, 234 N.W. 260 (1931).

[60]For example, the courts will generally allow a corporation to practice architecture in the absence of a prohibiting statute. People v. Allied Architects Ass'n, 201 Cal. 428, 257 Pac. 511 (1927); People *ex rel.* State Bd. of Examiners of Architects v. Rodgers Co., 277 Ill. 151, 115 N.E. 146 (1917). Some state legislatures have enacted provisions regarding the corporate practice of architecture. *E.g.*, ARK. STAT. ANN. § 71-302(3) (Supp. 1957) (corporate form may be used if every officer and director is licensed); COLO. REV. STAT. ANN. § 10-2-10(2) (Supp. 1957) (corporation shall not be licensed to practice architecture); PA. STAT. ANN. tit. 63, § 31 (1959) (corporation shall not be registered as an architect).

Some jurisdictions allow the corporate practice of optometry. Silver v. Lansburgh & Bro., 111 F.2d 518 (D.C. Cir. 1940); State *ex rel.* Harris v. Kindy Optical Co., 235 Wis. 498, 292 N.W. 283 (1940). Others hold that a corporation cannot engage in the practice of optometry. State v. Kindy Optical Co., 216 Iowa 1157, 248 N.W. 332 (1933); State *ex. rel.* Sisemore v. Standard Optical Co., 182 Ore. 452, 188 P.2d 309 (1947).

[61]1959-60 WASH. ATT'Y GEN. REP. no. 147 (September 29, 1960).

[62]*Ibid.* (quoting from) FLETCHER, CORPORATIONS 339 (rev. perm. ed. 1931).

[63]WASH. REV. CODE §§ 18.92.130 (reciprocity statute), 18.92.160 (suspension of license for "unprofessional conduct") (Supp. 1959).

[64]Letter from the director of the corporation section of the office of the Secretary of State of Iowa, December 12, 1960, on file in *Iowa Law Review* office.

[65]"[The Legislature] may deal with the different professions according to the needs of society in relation to each profession." Winberry v. Hallihan, 361 Ill. 121, 130, 197 N.E. 552, 557 (1935).

[66]Silver v. Lansburgh & Bro., 111 F.2d 518 (D.C. Cir. 1940) (learned professions do not include optometry); People *ex rel.* Kerner v. United Medical Serv., Inc., 362 Ill. 442, 200 N.E. 157 (1936) (authority to incorporate does not include learned professions, such as medicine and law); State *ex rel.* Harris v. Kindy Optical Co., 235 Wis. 498, 292 N.W. 283 (1940) (optometry held not to be learned profession); In the Matter of Co-op. Law Co., 198 N.Y. 479, 484, 92 N.E. 15, 16-17 (1910) (dictum) (authorization to form corporation for any lawful business does not include learned professions).

[67]Silver v. Lansburgh & Bro., 111 F.2d 518 (D.C. Cir. 1940) (dictum). Another court considered law, medicine, and dentistry as the learned professions. People v. Painless Parker Dentist, 85 Colo. 304, 310, 275 Pac. 928, 930 (1929) (dictum). In neither of the two cited cases did the courts elaborate so as to determine whether veterinary medicine was included in the term "medicine."

[68]See notes 45-53 *supra* and accompanying text.

[69]1959-60 WASH. ATT'Y GEN. REP. no. 147 (September 29, 1960).

[70]See People v. Painless Parker Dentist, 85 Colo. 304, 275 Pac. 928 (1929); People *ex rel.* Kerner v. United Medical Serv., Inc., 362 Ill. 442, 200 N.E. 157 (1936).

[71]1959-60 WASH. ATT'Y GEN. REP. no. 147 (September 29, 1960).

[72]See State v. Kindy Optical Co., 216 Iowa 1157, 248 N.W. 332 (1933); State *ex rel.* Loser v. National Optical Stores Co., 189 Tenn. 433, 225 S.W.2d 263 (1949).

[73]See Jones, *supra* note 39, at 355.

[74]State Electro-Medical Institute v. Platner, 74 Neb. 23, 29, 103 N.W. 1079, 1081 (1905). (Emphasis added.)

[75]See State *ex inf.* Sager v. Lewin, 128 Mo. App. 149, 106 S.W. 581 (1907); State Electro-Medical Institute v. State, 74 Neb. 40, 103 N.W. 1078 (1905); *cf.* State v. Brown, 37 Wash. 97, 79 Pac. 635 (1905) (unlicensed person hiring licensed dentists to carry on practice of dentistry held to be valid arrangement). State v. Brown, *supra*, was overruled by State v. Boren, 36 Wash. 2d 522, 219 P.2d 566 (1950).

[76]This contention was rejected in People *ex rel.* State Bd. of Medical Examiners v. Pacific Health Corp., 12 Cal. 2d 156, 82 P.2d 429 (1938), *cert. denied*, 306 U.S. 633 (1939). *But cf.* Group Health Ass'n v. Moor, 24 F. Supp. 445, 446 (D.D.C. 1938), *aff'd sub nom.* Jordan v. Group Health Ass'n, 107 F.2d 239 (D.C. Cir. 1939) (non-profit corporation).

[77]See cases cited in notes 74-75 *supra*. In State Electro-Medical Institute v. State, 74 Neb. 40, 43, 103 N.W. 1078, 1079 (1905), the court said: "Making contracts is not practicing medicine. Collecting the compensation therefor is not practicing medicine

within the meaning of the statute. No professional qualifications are requisite for doing these things."

The characterization of professional practitioners as independent contractors would not achieve the desired result of viewing the practitioners as "employees" within the terms of the deferred compensation benefit programs of the Internal Revenue Code. See text accompanying notes 16-20 *supra*.

[70]See, *e.g.*, People *ex rel.* State Bd. of Medical Examiners v. Pacific Health Corp., 12 Cal. 2d 156, 158-59, 82 P.2d 429, 430 (1938), *cert. denied*, 306 U.S. 633 (1939); Rosane v. Senger, 112 Colo. 363, 366, 149 P.2d 372, 374 (1944); In the Matter of Co-op. Law Co., 198 N.Y. 479, 483-84, 92 N.E., 15, 16 (1910).

[71]See, *e.g.*, County of Los Angeles v. Ford, 121 Cal. App. 2d 407, 413, 263 P.2d 638, 641-42 (2d Dist. 1953); People v. Peoples Stock Yards State Bank, 344 Ill. 462, 474, 176 N.E. 901, 907 (1901); State v. Bailey Dental Co., 211 Iowa 781, 784, 234 N.W. 260, 262 (1931); Bartron v. Codington County, 68 S.D. 309, 327-28, 2 N.W.2d 337, 346 (1942).

[72]See Jones, *supra* note 39, at 355.

[73]317 U.S. 519 (1943).

[74]*Ibid.*; see Group Health Co-op. v. King County Medical Soc'y, 39 Wash. 2d 586, 237 P.2d 737 (1951) (state anti-trust laws).

[75]The American Institute of Accountants' Rule Number 11 of the Rules of Professional Conduct provides: "A member shall not be an officer, director, stockholder, representative, or agent of any corporation engaged in the practice of public accounting in any state or territory of the United States or the District of Columbia." CAREY, PROFESSIONAL ETHICS OF CERTIFIED PUBLIC ACCOUNTANTS 147 (1956).

[76]*E.g.*, IOWA CODE § 116.6 (1958); WIS. STAT. ANN. § 135.07(2) (1957); see ILL. REV. STAT. ch. 110½, § 39 (1959) (only corporations registered prior to act may practice accounting).

[77]Letter from H. E. Kingman, Jr., on file in *Iowa Law Review* office October 6, 1960.

[78]In Butterworth v. Boyd, 12 Cal. 2d 140, 82 P.2d 434 (1938), the court held that the California Medical Practice Act deals only with the private practice of medicine and does not purport to regulate governmental activities of municipalities.

[79]See County of Los Angeles v. Ford, 121 Cal. App. 2d 407, 263 P.2d 638 (2d Dist. 1953).

[80]See L. Meisel & Co. v. National Jewelers Bd. of Trade, 90 Misc. 19, 26-27, 152 N.Y. Supp. 913, 918 (Sup. Ct. 1915) (dictum).

[81]Group Health Ass'n v. Moor, 24 F. Supp. 445 (D.D.C. 1938), *aff'd sub nom.* Jordan v. Group Health Ass'n, 107 F.2d 239 (D.C. Cir. 1939); Complete Serv. Bureau v. San Diego County Medical Soc'y, 43 Cal. 2d 201, 272 P.2d 497 (1954); County of Los Angeles v. Ford, 121 Cal. App. 2d 407, 263 P.2d 638 (2d Dist. 1953). *But see* Iowa Hosp. Ass'n v. Iowa State Bd. of Medical Examiners, Equity No. 63095, Polk County Dist. Ct. (Iowa 1955), reported in 45 J. OF IOWA STATE MEDICAL SOC'Y 629-35 (1955).

[82]See generally Hansen, *Laws Affecting Group Health Plans*, 35 IOWA L. REV. 209 (1950); Note, *Cooperation in Medicine*, 35 MINN. L. REV. 373 (1951.)

[83]See Group Health Ass'n v. Moor, 24 F. Supp. 445 (D.D.C. 1938), *aff'd sub nom.* Jordan v. Group Health Ass'n, 107 F.2d 239 (D.C. Cir. 1939); Butterworth v. Boyd, 12 Cal. 2d 140, 82 P.2d 434 (1938). See also American Medical Ass'n v. United States, 317 U.S. 519 (1943) (efforts by medical association to coerce members to disassociate with group health plan held to be violative of Sherman Act).

[84]See generally Holman & Cooley, *Voluntary Health Insurance in the United States*, 35 IOWA L. REV. 183 (1950).

[85]See People *ex rel.* State Bd. of Medical Examiners v. Pacific Health Corp., 12 Cal. 2d 156, 82 P.2d 429 (1938), *cert. denied*, 306 U.S. 633 (1939); People *ex rel.* Kerner v. United Medical Serv., Inc., 362 Ill. 442, 200 N.E. 157 (1936).

[86]See Hansen, *supra* note 90, at 219-22.

[87]The court in Silver v. Lansburgh & Bro., 111 F.2d 518 (D.C. Cir. 1940), held that the prohibition against professional corporations did not apply to the practice of optometry:

> Both in the case of the physician and the lawyer, the person seeking his services must break down the barriers of reserve which otherwise serve to protect him and deliberately reveal to his professional adviser secrets of physical or mental disability or secrets of business of the most intimate nature. These necessary disclosures create the personal relationship which cannot exist between patient or client and a profit-seeking corporation. The universal recognition of this immediate, unbroken, and confidential association between doctor and lawyer and those who engage their services early created and still justifies the rule that their allegiance must be wholeheartedly to the patient or the client, and not to another. Nothing of this nature applies to the practice of optometry. *Id.* at 520.

The Uniform Rules of Evidence extend the privilege of confidential communications to lawyers, physicians, and the clergy. UNIFORM RULES OF EVIDENCE 26-27, 29. No such privileged communication exists for the veterinarian. Hendershot v. Western Union Tel. Co., 106 Iowa 529, 76 N.W. 828 (1898).

[88]See proposal for the form of a professional corporation in Jones, *The Professional Corporation*, 27 FORDHAM L. REV. 353, 360-63 (1958).

[89]A state professional incorporation law is advanced in Wormser, *A Plea for Professional Incorporation Laws*, 46 A.B.A.J. 755 (1960).

[90]A bill of this nature was introduced in the 59th Iowa General Assembly on February 21, 1961. This bill would amend IOWA CODE ch. 47 (1958) to permit a corporation to obtain a license to practice a profession provided for under IOWA CODE § 147.1 (1958) when all of the corporation's officers, directors, and shareholders are also licensed. No corporation could receive a license to practice more than one profession. The professional corporation would afford no limitation of liability for torts committed by the corporation's agents, employees, officers, directors, or shareholders in the scope of their employment or by professional activities on behalf of the corporation. The shares of stock could be held only by licensees who are natural persons. Proxies could only be given to a person licensed to practice the profession of the corporation. Upon the death or retirement of a shareholder, the corporation would have to redeem all of the shares of such shareholder unless the shares were promptly purchased by the remaining shareholders or other licensed practitioners. The proposed amendment would subject the corporation's license to revocation (1) upon the revocation of the professional license of any officer, director, or shareholder not promptly retired by the corporation; (2) should any judgment for malprac-

tice against the corporation remain unsatisfied; (3) upon final order of the state board governing the profession for violation of the standards or rules of ethics of the profession; or (4) upon the death or surrender of the license of the last remaining shareholder. H.F. 417, 59 Iowa G.A. (1961). Since this bill only refers to the practice of certain professions regulated by the state department of public health, its provisions would not include veterinarians.

[99]See, *e.g.*, Louis K. Liggett Co. v. Baldridge, 278 U.S. 105 (1928) (statute providing that only licensed pharmacists may have ownership interest in drug stores invalidated); Jay Burns Baking Co. v. Bryan, 264 U.S. 504 (1924) (statute providing for minimum and maximum weights of loaves of bread held to be arbitrary and unreasonable).

[100]216 F.2d 418 (9th Cir. 1954), 40 Iowa L. Rev. 663 (1955).

[101]Int. Rev. Code of 1954, § 7701.

[102]296 U.S. 344 (1935).

[103]Morrissey v. Commissioner, 296 U.S. 344, 359 (1935).

[104]Kintner v. United States, 107 F. Supp: 976 (D. Mont. 1952).

[105]United States v. Kintner, 216 F.2d 976 (9th Cir. 1954), 40 Iowa L. Rev. 663 (1955).

[106]Galt v. United States, 175 F. Supp. 360 (N.D. Tex. 1959).

[107]Treas. Reg. § 301.7701-2(a)(1) (1960).

[108]*Ibid.*

[109]Treas. Reg. § 301.7701-2 (a) (3) (1960).

[110]Treas. Reg. § 301.7701-1(c) (1960).

[111]*Ibid.*

[112]See note 80 *supra* and accompanying text.

[113]Treas. Reg. § 301.7701-2(c)(4) (1960).

[114]Crane Partnership § 65, at 348 & n.16 (2d ed. 1952).

[115]See Uniform Partnership Act § 31; Crane, *op. cit. supra* note 114, § 73.

[116]See Maier & Wild, *Taxation of Professional Firms as Corporations*, 44 Marq. L. Rev. 127, 139 (1960).

[117]Treas. Reg. § 301.7701-2(e)(1) (1960).

[118]See note 79 *supra* and accompanying text.

[119]Treas. Reg. § 301.7701-2(e)(1) (1960).

[120]Treas. Reg. § 301.7701-2(e)(2) (1960).

[121]*Ibid.*

[122]Treas. Reg. § 301.7701-2 (g), example (1) (1960).

[123]*But see* Maier & Wild, *supra* note 116, where the authors conclude that a professional organization can qualify to be taxed as an association under the new regulations. A form of articles of association for unincorporated associations, prepared by the law department of the American Medical Association, is reproduced in Maier & Wild at 143-45.

Added Precautions Required on Streptomycin Labels

New labeling requirements to assure safe use of dihydrostreptomycin drugs and dihydrostreptomycin-streptomycin mixtures for human parenteral injection (subcutaneous, intramuscular, etc.) became effective May 2.

Reasons for the new requirements were based on a recent discovery that auditory impairment or total deafness can result from use of a much smaller amount of dihydrostreptomycin or its use for a much shorter period than was formerly believed necessary to produce injury.

Under the new requirements, outside wrappers or containers and the immediate containers of dihydrostreptomycin must bear the statement:

"Warning: For use only in patients who cannot tolerate streptomycin."

In the case of the dihydrostreptomycin-streptomycin mixtures, the statement must read:

"Warning: For use only in the treatment of tuberculosis in patients who cannot tolerate full dose of streptomycin."—*U.S. Food & Drug Admin. Release, May 2, 1961.*

Editorial

Personalized Veterinary Service for Farm Animals Not Outmoded

Freedom from disease has been a major factor responsible for our productive livestock industry. This freedom from disease has been made possible, in no small measure, by the rural veterinary practitioner conducting a routine practice. He has greatly contributed to the eradication of bovine brucellosis and tuberculosis. He has vaccinated countless numbers of hogs, protecting them from cholera and erysipelas. He has saved untold numbers of cows in the throes of parturition at all hours of the day and night. He has performed with consistent success many routine, minor, but necessary veterinary chores, including countless castrations and dehorning operations. He has minimized the health hazards arising from brutal and inhumane handling of animals by his application of skillful restraint techniques and anesthetics. He has performed other services equally important but too varied and numerous to mention. The fact that some individual veterinarians have not always been cooperative or performed with great dedication detracts only slightly from the over-all results.

By examining this brief listing of accomplishments, we can gain an understanding of why the rural practitioner has been successful. He has been characteristically a worker and not an armchair supervisor operating by remote control. He has been able to transform personally and directly to his patients the veterinary medical knowledge in his head and the dedication in his heart. One only has to analyze the relatively poor livestock health and low production figures in countries where veterinarians do not give this personal attention to their patients to realize how important it is. Probably nothing has had greater significance in shaping his success than the application of professional service at the "grass roots" or, in other words, personalized professional attention to animal patients.

Since there is a trend toward larger and more complex livestock production units, can we expect this personalized service to become outmoded? It is not likely. Animals belonging to big producers as well as small farmers will continue to get sick as individuals as well as herds, even with prophylactic feeds and protective vaccinations; dystocias, postparturient disorders, mastitis, parasitism, and stress diseases will continue to occur even with good feeding practices and breeding programs; accidental injuries will happen even under excellent management conditions. Consequently, we must assume that the demand for personalized professional service will continue for many years. Furthermore, we can fulfill our responsibility for the health of the nation's livestock only as long as we, as a profession, continue to provide this service.
—A. F.

Clinico-Pathologic Conferences (CPC) To Be Reported in JOURNAL

The first of a series of clinico-pathologic conferences appears on page 263 of this issue. The participants at this conference, which was held at the School of Veterinary Medicine, University of Pennsylvania, Philadelphia, were members of the faculty and invited guests.

All discussion was recorded and transcribed verbatim. The material was edited for clarity and to remove unrelated comment and discussion. In addition to the coordinators, Dr. R. S. Brodey and Dr. J. E. Prier, others on the faculty were consulted in regard to specific editorial problems. An attempt was made to retain the impression of direct conversation and particularly to include controversies that developed.

When the case was presented, only the attending clinician and the pathologist were aware of the final diagnosis. The

discussants knew only the clinical facts presented and were asked to base their analyses on such information. Thus, the diagnosis made by these individuals could differ from the actual diagnosis as described finally by the pathologist. In every case, those who discussed the material were asked to detail their reasoning in reaching conclusions and to give particular attention to differential diagnosis.

Subjects of future conferences selected for presentation will involve all species of domestic animals and include flock and herd problems as well as individual cases. All pertinent laboratory data, radiographs, photographs, and photomicrographs will be included. Preliminary diagnosis will be made on a clinical basis. Final diagnosis will be made on either an etiologic or pathologic basis.

A Matter of Ethics

In a recent issue of a feed industry magazine, a veterinarian employed in the research department of a feed company cited a number of examples of how feed salesmen, feed dealers, and veterinarians could cooperate to the benefit of livestock owners. In one example, he urged that veterinarians seek out feed dealers, feed salesmen, farmers, and growers and explain to them the value of veterinary service. There was a time when such aggressive activity was considered undignified, unethical, and unprofessional. Is it still unbecoming to the profession? Does it detract from the scientific stature the animal-owning public expects of veterinarians? Does it consequently detract from the veterinarian's utilitarian value?

An unqualified "yes" or "no" answer to these questions would be ridiculous. Veterinary medicine has so many facets that professional behavior has to be considered in the light of many things such as geographical area, species involved, and individual situations. Perhaps the best guideline for all is simply to adhere to the pledge contained in the Veterinarian's Oath: "The health of my patients, the best interest of their owners, and the welfare of my fellow man will be my primary considerations."—A.F.

from the *Research Journal*

Respiratory Disturbances Caused by Halothane Anesthesia

In all the species studied, halothane administered with pure oxygen caused a depression of pulmonary ventilation which was greatest in sheep. As a consequence of this respiratory depression, CO_2 retention occurred producing a respiratory acidosis. Removal from the anesthetic atmosphere caused a rapid return of pulmonary ventilation to preanesthetic levels and a recovery from the respiratory acidosis.—[*E. W. Fisher: Observations on the Disturbance of Respiration of Cattle, Horses, Sheep, and Dogs Caused by Halothane Anesthesia and the Changes Taking Place in Plasma pH and Plasma CO_2 Content. Am. J. Vet. Res., 22, (March, 1961): 279-286.*]

Recovery of Western Equine Encephalomyelitis Virus

Five adult pigeons, having neutralizing indexes of less than 8 against western equine encephalomyelitis (WEE), were each inoculated with 104 chick LD_{50} of WEE virus. One bird died due to a blood dycrasia. Virus was recovered in the crop secretions from 3 of 4 of the remaining pigeons at 48 hours postinoculation and from 2 of the 4 pigeons at 72 hours postinoculation. Virus was found in the blood from 12 hours postinoculation through 96 hours postinoculation.

No virus was recovered from the fecal specimens.—[*J. F. Winn and D. F. Palmer: Recovery of Western Equine Encephalomyelitis Virus from Crop Washings of Experimentally Infected Pigeons. Am. J. Vet. Res., 22, (Jan., 1961): 139-141.*]

New Books

The Veterinary Annual, 1960

This 2nd edition of the *Veterinary Annual* follows closely the pattern of the 1st edition. There are 35 contributing authors, most from Great Britain; 8 special articles on various phases of veterinary medicine in different countries of the world; and 16 chapters reviewing the current literature on subjects dealing with animal diseases caused by microorganisms, metabolic disorders, radiology, radiation, physiology, drugs, and surgery. Veterinarians engaged in almost every phase of veterinary medicine will find some sections that will apply to their special field of interest. For the most part, the work is authoritative and reliable.

The section on veterinary medicine in the United States is likely to be misleading to those in other parts of the world who are not familiar with the present status of veterinary practice and livestock production in this country. This section implies that a significant change in the conduct of veterinary practice has taken place in this country, whereas, in reality, it has changed only moderately from what it was 10 years ago. The significant increase in the percentage

of small animal practitioners is not mentioned. The decline in numbers and quality of applicants to veterinary schools is exaggerated.

The book is generally well-edited and well-written, but the liberal use of investigators' names and reference dates throughout the report makes reading rather tedious.

The *Annual* is most likely to find its place as a useful reference work. It is not likely that it will provide particularly good leisure-time reading or much usefulness in cases of emergency, as hoped by its editor.—[*The Veterinary Annual, 1960. Edited by W. A. Pool. 2nd ed. John Wright & Sons, Ltd., Bristol; MacMillan Co., Toronto; Williams & Wilkins Co., Baltimore, 1960. Price: $8.75.*]

Advances in Small Animal Practice

This volume is a compilation of the reports presented at the 1960 British Small Animal Congress. The editor and contributors are to be congratulated for the excellent preparation of the manuscripts. The discussion which follows each report is particularly valuable. However, the title is somewhat misleading and the majority of the material is readily available in detail in standard textbooks and other veterinary publications.

Those reports dealing with the veterinarian's responsibility to dog breeders, especially at shows, were particularly well written. The excellent attitude expressed in attempting to handle this problem is especially worthy of attention.

The section of the meeting devoted to surgery was particularly interesting; however, the published work suffers from lack of illustrative materials.

The amount of space devoted to advertising and description of the commercial exhibits is excessive for a book of this price. —[*Advances in Small Animal Practice. Vol. II. Proceedings of the British Small Animal Veterinary Association. Edited by Bruce V. Jones. 148 pages; illustrated. Pergamon Press, New York, N.Y. 1960. Price $8.50.*] —E. F. DONOVAN.

Dogs in My Life

This book, written primarily for the entertainment of pet owners, is authored by a veterinary practitioner from North Carolina. It is a compilation of anecdotes based on personal experiences with animal patients and their owners.—[*Dogs in My Life. By Louis L. Vine with Ina Forbus. 277 pages. Appleton-Century-Crofts, Inc., New York, N.Y. 1961. Price $4.50.*]

Books Received but Not Reviewed

CONTROL OF OVULATION; Proceedings of the Conference held at Endicott House, Dedham, Mass., 1960. Edited by Claude A. Villee. 251 pages; illustrated. Symposium Publications Division, Pergamon Press, New York, N.Y.; Oxford; London; and Paris. 1961. Price $10.00.

LABORATORY ANIMALS I. GUIDE FOR SHIPMENTS OF SMALL LABORATORY ANIMALS. A Report of the Institute of Laboratory Animal Resources. Prepared by the Committees on Husbandry and Transportation, Production, and Laboratory Animal Transportation. Publication 846. 21 pages; illustrated; paper bound. National Academy of Sciences-National Research Council, Washington, D.C. 1961. Price $1.50.

THE DOG IN MEDICAL RESEARCH. Revised edition by Keith S. Grimson, M.D. 15 pages; paper bound. Public Health Service Publication No. 312, revised 1961. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Price 15 cents.

HORSESHOES OF INTEREST TO VETERINARIANS by Dr. Henry Asmus. 24 pages; illustrated. Ken Kimbel, Plant City, Fla., 1946. Price $1.00 postpaid.

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WHAT IS YOUR Diagnosis?

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Fig. 1—Lateral radiograph of the dog's head, showing the lesion in the parietal and temporal bones.

History.—For at least 2 years, there had been a hard lumplike process attached to the right parietal region of the skull of a spayed female Cocker Spaniel, 10 years old. During the past 6 months, the process had enlarged and there were signs of discomfort when the area was palpated. The skin and the hair over the lesion were not disturbed. Radiographs of the skull were taken (Fig. 1).

This case report was presented by J. Raymond Currey, D.V.M., Washington, D.C., and was prepared with the assistance of Wayne H. Riser, D.V.M., M.S., Kensington, Md.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—An osteolytic-osteogenic lesion of the bones of the dorsal aspect of the skull was suggestive of tumor.

Comment.—On cross section of the skull, the process was found to extend across the midline to the left and to involve at least half the bony skull on the right (Fig. 2 and 3). The dura mater was intact and the process, even though it destroyed the bone and displaced the muscle, did not invade the cranial cavity.

On histologic examination, the lesion proved to be an epidermoid inclusion cyst (cholesteatoma). It was composed of small cavities lined by well-differentiated squamous epithelium. The cavities contained keratohyaline masses, made up of cheesy, compact, and flaky material and dead cornified epithelial cells often called "pearly bodies." These structures were supported by a heavy collagen matrix. The periphery of the mass was enclosed by a heavy growth of reactive (cancellous) bone. In the radiograph, the reactive bone has the appearance of an osteogenic tumor.

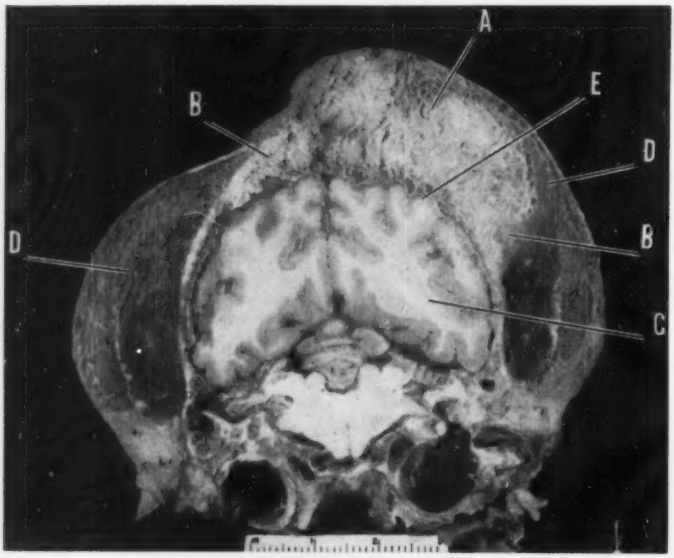

Fig. 2—Cross section of the dog's head, showing the extent of the lesion (A), cancellous bone (B), cerebrum (C), muscles (D), and dura mater (E).

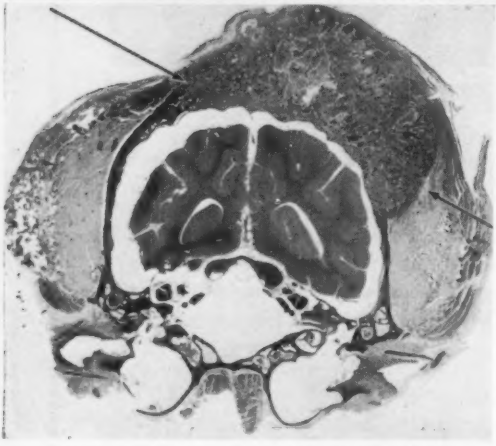

Fig. 3—Histologic cross section of the head, prepared from tissue shown in Figure 2. Notice the cancellous bone (arrows) that appears at the edges of the lesion.

Embryologic investigation furnishes the best clue to the pathogenesis of an epidermoid cyst. It arises from a displaced cutaneous ectoderm. The displacement is thought to occur in early fetal life when the neural fold is formed at the midline. At that time, small aberrant epithelial nests are pulled into the mesoderm near the midline. In this case, the epithelial inclusion was encased in the diploe of the membranous bone of the skull from which it proceeded to grow and to destroy the bone of the skull later in the life of the dog.

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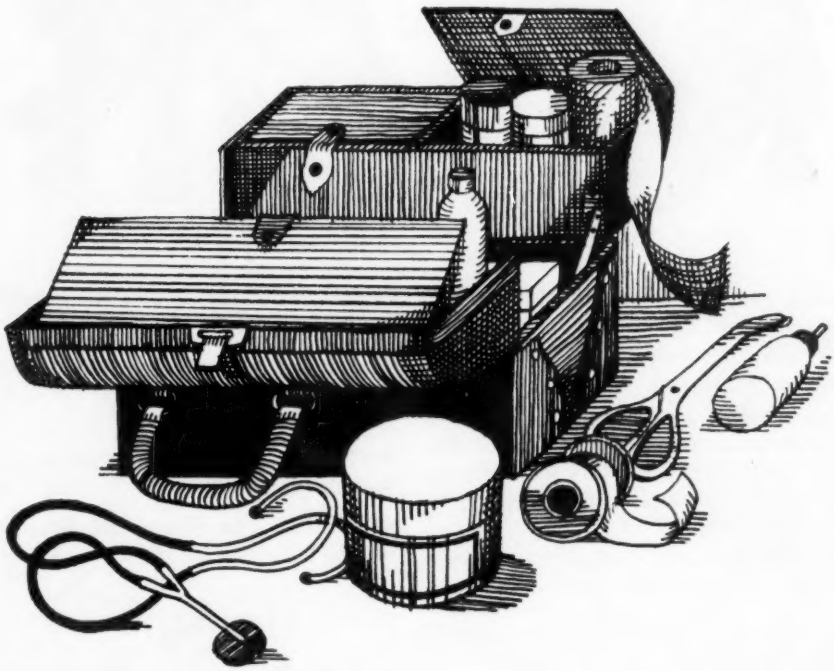

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CLINICO-PATHOLOGIC CONFERENCE

From the School of Veterinary Medicine
University of Pennsylvania

First Admission

Dr. R. S. Brodey.—On Aug. 19, 1960, a 5½-year-old Collie-type dog was referred to the clinic by a local practitioner. The animal was resident in one area of Philadelphia for its entire life and, to the owner's knowledge, had no contact with other dogs in recent months. The only previous illnesses had been bronchitis 3 years before, and an abscess on the left hindleg approximately 6 months before, which had been treated successfully. The latter resulted from a dog-bite wound.

On August 8, the owner noticed blood in the feces, and from August 12 to 14 he observed that the urine was brown. On August 14, the feces were gray but the next day were soft and yellow. The appetite remained good, with little if any weight loss. There was no alteration in the animal's activity or personality up to this point. About August 14, the owner 1st noticed a yellowish color of the dog's skin.

The findings on physical examination were: temperature, 104.0 F.; pulse rate, 140; respiration rate, 53; pronounced jaundice; slight enlargement of left popliteal lymph node; and a tense abdomen. Except for obvious flea infestation (the dog had been sprayed the day before by the referring veterinarian), the remainder of the physcial and a complete neurologic examination were not remarkable. Radiographs of the abdomen revealed no abnormalities.

Laboratory examinations revealed: white blood cell count, 15,800; segmented neutrophils, 86%; nonsegmented neutrophils, 4%; lymphocytes, 6%; monocytes, 4%; hemoglobin, 15.3 Gm./100 ml.; red blood cell count, 6,900,000; blood urea nitrogen, 22.4 mg./100 ml.; bromsulfophthalein retention, 60% in 30 minutes. Urinalysis: specific gravity, 1.024; pH, 6.0; WBC, positive; RBC, negative; many bacteria; moderate number of epithelial cells; urobilinogen, positive at 1:4 dilution but negative at higher dilutions. Fecal examination for parasites was negative. Attempts to visualize the gallbladder radiographically were unsuccessful.

Prepared by:

R. S. Brodey, D.V.M., M.Sc. (V.S.)

Assistant Professor of Veterinary Surgery

J. E. Prier, D.V.M., Ph.D.

Associate Professor of Virology

Penicillin (600,000 units), streptomycin (0.5 Gm.), and a vitamin preparation* (1 ml.) were administered. On August 20, the dog had a normal temperature and an exploratory laparotomy was performed.

The liver was smaller and firmer than normal and had some grayish yellow patches. The gallbladder was not obstructed, and no abnormalities were noticed in the abdomen. Recovery from surgery was uncomplicated but, on August 23, the body temperature rose to 103.7 F., respiration rate was rapid, and feces were soft.

*Methischol, U.S. Vitamin and Pharmaceutical Corp., New York, N.Y.

On August 24, the dog was discharged. Three days later, when it was returned for stitch removal, the owner reported that the urine and feces were normal, and that the dog was making excellent progress. There was still slight abdominal tenderness but only a trace of jaundice. Vitamins were again prescribed, and the owner was advised to return the animal if its condition did not continue to improve.

Second Admission

Dr. R. S. Brodey.—On Nov. 2, 1960, the dog was returned and hospitalized. In September his personality changed sharply, and became particularly irritable and growled frequently. Polydypsia and polyuria were also observed. Vomiting occurred in September, but was controlled by more frequent feeding of small amounts. Episodes of vomiting recurred beginning on October 25. Three days before this visit, the dog started to drink even greater volumes of water, and began to urinate and defecate in the house. Within the past 24 hours, blood had been noticed in the feces.

Jaundice was pronounced; the feces were dark in color, contained mucus, and had an extremely foul odor. The dog was generally alert but did have a tendency to snap, a characteristic that had not been observed previously. The body temperature was normal. Urinalysis revealed: specific gravity, 1.016; pH, 6.5; bile, positive; a few RBC. Other tests revealed: bromsulfophthalein retention, 42% in 30 minutes; uric acid, 2.2 mg.; blood urea nitrogen, 16.8 mg./100 ml. Blood count was: RBC, 6,900,000; WBC, 13,700; segmented neutrophils, 77%; nonsegmented neutrophils, 3%; lymphocytes, 6%; eosinophils, 4%; monocytes, 10%; and hemoglobin, 15.6 Gm./100 ml.

On Nov. 5, 1960, after the body temperature had reached 104.2 F., the dog had an epileptic seizure and died at 12:45 p.m.

Clinical Discussion

*Dr. Joseph S. Skelley**.—I am impressed with the lack of information and data that might lead toward a more specific diagnosis. There are a number of things that might be considered, based on all or on some of the clinical signs. One possible diagnosis is gastrointestinal infection. Some of the tests which might be made in a gastrointestinal infection are lacking. Usually we do a rectal culture, although I must frankly admit that in many cases it is not too helpful. Also, we're interested in whether the normal flora is present. In a gastrointestinal infection, there's a good chance that there would be either partial or complete anorexia. In addition to blood in the feces, other signs were evident such as brown-colored urine and jaundice which developed shortly after the initial stages. I do not believe that these are compatible with a diagnosis of gastrointestinal infection.

Another possibility to be considered would be that of intestinal obstruction. I would expect anorexia in cases of intestinal obstruction. Second, abdominal palpation, was negative, although there was some "muscle guarding" which tended to interfere with palpation. There is no indication of the degree of intestinal peristalsis.

Hypermotility might be expected in the earlier stages of intestinal obstruction or lack of peristaltic sounds in later stages. Thirdly, abdominal radiographs did not substantiate the diagnosis of intestinal obstruction.

Another consideration is the possibility of acute or subacute pancreatitis. The dog did have abdominal tenderness, an elevation of temperature, some degree of pain, and blood in the stool. I would expect a dog with acute pancreatitis to have more severe clinical signs. On the other hand, the signs in this dog might be consistent with a diagnosis of subacute pancreatitis. Therefore, we would not disregard completely the possibility of some associated pancreatic involvement.

Other considerations (based mainly on the presence of jaundice) are either some type of hemolytic disease or some form of liver disease. The blood study does not substantiate the possibility of the hemolytic disease because the hemoglobin and red blood cell count were normal.

One might think about infectious canine hepatitis in considering liver disease, but I think the age of the animal and the duration of the problem would be 2 reasons for

*Dr. Skelley is assistant professor of medicine.

eliminating this possibility. However, I feel there is some type of liver problem present. Jaundice, associated with liver changes, might be either hepatocellular or obstructive in origin. We have 2 different reports of bromsulfophthalein (BSP) tests and both are elevated substantially. The BSP test is a measure of the excretory function of the liver. The dye, injected into the blood stream, is picked up by the liver cells and excreted in the intestinal tract. Any retention of BSP in the blood stream might indicate 1 of 2 things: either the liver cells are incapable of picking up dye and excreting it, or there is some type of obstruction present. The test does not specifically determine the site of the problem.

The urinary urobilinogen, positive in a 1:4 dilution, I would consider normal. In cases of hepatitis, significant levels of 1:64 are reported. In man, it is considered to be normal up to dilutions of 1:20. The urobilinogen, once formed in the intestinal tract, is partly excreted in the feces and partly picked up by portal circulation where it is re-excreted by the liver. The presence of increased amounts of urobilinogen in the urine is a reflection of the integrity of the liver cells.

The brown color of the urine would be considered due to bilirubinuria, as one might expect in a case of well-established jaundice. Considering the possibility of either hepatogenous or obstructive jaundice, there are a number of things which might be thought of on a comparative basis. First, the jaundice in hepatogenous jaundice usually develops rapidly, whereas in obstructive jaundice it is a progressive gradual development. In incomplete obstruction, it may be intermittent. Abdominal pain is reported in hepatogenous jaundice in about 50% of the cases, whereas in obstructive jaundice it is present in most of the cases. Fever is present in both, and of course the dog did have an elevated temperature.

In hepatogenous jaundice, the spleen is often found to be enlarged on clinical or radiographic examination. In obstructive jaundice, it is normal. The feces in hepatogenous jaundice usually are light-colored initially, and then become increasingly stained with bile. On the other hand, in obstructive jaundice they are permanently light-colored. With incomplete obstruction, there may be bile present intermittently.

The blood count did not reveal any overall increase in the leukocytes, but there was marked neutrophilia. Neutrophilia is compatible with a great number of things, including liver disease. Apparently those who were handling the case thought there might be some involvement of the gallbladder, for they indicated that they were unable to visualize the gallbladder radiographically. At laparotomy, I understand that the gallbladder did appear normal, and it was palpated for the presence of stones.

The liver was reported as being somewhat smaller and firmer than normal and had some grayish yellow patches. These patches might be interpreted either as old scars left over from ascarid migration or associated with some focal necrosis. I would also suspect some degree of cirrhosis, since the liver was somewhat smaller and firmer than normal. In deciding on the possibility of obstructive jaundice, we might consider whether it is intrahepatic or whether it involves the main portion of the biliary tree. There have been reported cases of cholangitis associated with infiltration of the periportal structures and swelling of the smaller bile radicles. This is usually associated with reactions to such drugs as chlorpromazine and substances of this nature. We have no history that the animal had been exposed to anything of this type.

Initially, in these cases, there is usually jaundice, although this tapers off somewhat. Also, in these cases, there is a tendency to recover in 2 or 3 weeks although, in some instances, it may be prolonged for long periods of time. There is also another condition, known as primary cholangitis, in which the inflammatory changes are not associated with any known toxic agent. In rare cases, it has been suggested that this has resulted from jaundice of an infectious nature. These do have recurrent episodes and are often chronic, eventually resulting in some degree of biliary cirrhosis.

The uric acid was elevated to 2.2 mg. The normal range is 0.5 to 1.5 mg. Normally uric acid is stored and mainly excreted by the kidney. If there are excessive amounts present, there may be attempts on the part of the tissues or the liver to break down some of this substance. The end product is not exactly known. To some extent, the uric acid may be helpful in mak-

ing a diagnosis of liver disease. In addition, there were 2 urinalyses. One was normal, but the 2nd revealed the presence of casts, red and white blood cells, epithelial cells, many bacteria, and some slight increase in specific gravity.

There was mention in the case record of polydypsia and polyuria, but I think on the basis of the urinary changes reported that we do have some indication of involvement of the kidneys, although the BUN does not suggest that the animal has become decompensated to any degree.

What I have said so far, then, brings us to a point where I should try to decide just where in the liver the lesion or problem is located. Lacking many of the specific laboratory data which are desirable in differentiating types of jaundice and liver disease, I find it extremely difficult to be specific. I believe there is probably some type of partial obstruction producing jaundice as well as some degree of associated cellular involvement.

The changes in personality would suggest a lesion in the frontal lobe of the cerebrum. If it were in the parietal lobe, you would expect to see a dog which might be called a "dummy," because it would frequently pace about and seem indifferent to its surroundings. If there were involvement of the cerebellum, you might expect to see other neurologic signs such as ataxia. I find it difficult to associate this change directly with the changes noticed in the liver.

In the beginning of the case history is the fact that, 6 months before the dog was presented, there was an abscess resulting from an old fight wound. At the time of examination for the current problem, there was still some slight enlargement of the popliteal node near the site of the bite wound. I don't know whether this is a red herring or whether there might be some residual infection.

It would be my opinion that the dog was exposed to some toxic agent which has produced damage, primarily to the biliary tree, probably on a partial obstruction basis, and secondarily to the liver parenchyma. It also resulted in a lesion involving the frontal lobes of the cerebrum. If the latter lesion was of a toxic origin, it is reasonable to assume possible involvement of other areas besides the liver.

*Dr. W. Malherbe**.—In reading through this report, I find myself in the position of saying "Why wasn't this done?" and "Why wasn't that done?" We have, to begin with, gray feces which suggests either liver or pancreatic involvement. A serum amylase determination, which could have been done immediately, would have given some information as to early acute pancreatic disease. The feces should have been examined for trypsin activity. There is no report of anything like that having been done.

The combination of gray feces, brown urine, jaundice, and good appetite suggests obstruction involving the liver. On the other hand, the picture changes somewhat later in that there is a report of blood in the feces.

The presence of jaundice indicates the necessity of laboratory examination from the point of view of differential diagnosis of obstructive versus hepatocellular jaundice.

As far as obstruction is concerned, there is some support in the rather high BSP shortly after the 1st admission. The BSP rises more in obstruction than it does with hepatocellular damage. Two important tests that should have been made are serum transaminase and alkaline phosphatase. The latter is very high in obstruction and less high in hepatocellular jaundice. As a matter of fact, some workers suggest that the ratio between those 2 determinations might give a pretty good indication of obstructive versus hepatocellular damage. The finding at surgery that the gallbladder was empty is, of course, against mechanical obstruction. We have had instances, however, of intrahepatic cholestasis occurring in South Africa in dogs that have been overdosed with acetarsol.

The Van den Bergh reaction is a notable omission here. In obstruction, the "direct" reaction (for conjugated bilirubin) is very high as compared to "indirect" (unconjugated bilirubin), whereas in hepatocellular jaundice the "direct" reaction would be only somewhat higher than the "indirect."

Albumin would decrease in hepatocellular damage, whereas it does not in obstructive. Ratios of albumin to globulin are of value in showing up hepatocellular dam-

*Dr. Malherbe is professor of medicine.

age. Uric acid is a thing that I have not been very much impressed with as a test of liver function, although it is often used. In one study, the use of BSP retention was compared with uric acid. It was found that uric acid is decidedly less reliable as a liver function test.

There's no one test that would give the answer right away; a group of tests should be conducted in order to permit evaluation of them in relation to each other. The question of personality change worries me quite a bit too. The initial illness gives the impression of obstructive icterus but, later on, we learn of the cantankerousness, irritibility, and growling which suggests advancing kidney failure. The BUN was within normal limits. I feel that this determination should have been repeated on perhaps a couple of occasions. I find it rather difficult, unless the brain was involved, as Dr. Skelley mentioned, to suggest why the temperamental change should have come about. Infectious hepatitis is very unlikely. I have never seen jaundice as a result of infectious hepatitis.

It seems a pity that a whole battery of tests was not run, particularly at the 1st admission. There appear to be 2 organ systems involved here—the liver and the kidneys.

*Dr. R. M. Schwartzman**.—I'm concerned about the omission of one diagnostic aid, a test even more direct than some of the functional liver tests that were mentioned by Dr. Malherbe. I cannot understand why there was not a biopsy made of the liver, especially at surgery. There is one other point that I would like to bring up. In reading this case report, I do not see the justification for laparotomy without a readily available diagnosis.

Dr. Prier.—Laparotomy was performed during the original hospitalization on the basis of suspected obstructive jaundice. The reason that we didn't take a biopsy was based on our judgment and consideration of the animal's condition at the time, coupled with obvious liver lesions that might have led to adverse sequelae.

Dr. Schwartzman.—It's unfortunate, though, that a biopsy was not taken for microscopic examination and possibly culture. I have the general impression that liver function tests in general are difficult to interpret. The Van der Bergh test is not easy to interpret because liver disease is a very complex problem. I would depend more on biopsy procedures, if they were possible, than I would on function tests.

Dr. Malherbe.—It has been stated in the medical literature that liver biopsy is an unreliable method of diagnosis. I quite realize that there are no short cuts to this problem, and that one just has to collect all the possible information and try to evaluate it as best one can.

*Dr. H. Fegley***.—I'd like to ask Dr. Skelley to explain the temperature rise in association with liver disease.

Dr. Skelley.—The temperature elevation depends partly upon the causative agent. It may be elevated if the agent is infectious or toxic in origin or if there is cellular breakdown.

Clinical Diagnoses

Toxic cirrhosis
Obstructive hepatitis
Frontal lesion (cerebrum)
Nephritis

Pathologic Findings

Dr. Fegley.—The important gross and microscopic findings were confined to the liver. On gross examination, the right side of the liver contained irregular yellowish areas in place of the normal parenchyma. The cut surface was yellow and there were also areas of greenish discoloration. The yellow color would imply fatty metamor-

*Dr. Schwartzman is assistant professor of medicine.

**Dr. Fegley is instructor of pathology.

phosis, the greenish discoloration would imply staining by excess bile. The left side of the liver was yellow-brown and mottled with gray. The yellow-brown again would imply some fatty metamorphosis; the gray would imply scar tissue. On microscopic examination of the liver, there was extensive cirrhosis, which is defined as either an apparent or real increase in connective tissue. It also implies that there is destruction of liver cells. Associated with the cirrhosis there were biliary hyperplasia and extensive fatty metamorphosis with vacuolization of the parenchymal cells. There was congestion, hemorrhage, and focal necrosis. Hemosiderin was present, particularly in the areas of focal necrosis and fatty metamorphosis. In summary, there was extensive cirrhosis of the liver, probably of toxic origin.

Examination of the brain revealed encephalopathy. This was not considered particularly significant since encephalopathy can be found in almost any animal dying under similar conditions.

Pathologic Diagnosis

Cirrhosis
Fatty metamorphosis of liver

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Classification and Treatment of Snake Bites

A modification of the clinical classification by Wood, Hoback, and Green of North American pit-viper venenations (poisonings) has been developed to classify snake bites as follows:

Grade 0—no venenation; fang or tooth marks present, minimal pain, less than 2.5 cm. of surrounding edema and erythema, and no systemic involvement.

Lack of venenation may result from an insufficient amount of venom, failure of the venom gland-fang mechanism, broken fangs, or indirect hits with the fangs. Antivenin should never be given for grade 0 bites.

Grade I—minimal venenation; fang or tooth marks present, moderate pain, 2.5 to 12.7 cm. of surrounding edema and erythema in the 1st 12 hours after the bite, and no systemic involvement.

Use of tourniquet, incisions, suction, and 10 ml. of antivenin are indicated. Generally, antivenin should be injected into the bite area, provided the bite is not on the phalanges. Although cortisone and ACTH may have favorable effects, they do not influence the case fatality rates in laboratory animals poisoned with venom. Antibiotics are indicated because snakes' mouths and venoms harbor pathogenic organisms. A broad-spectrum antibiotic would probably be a better choice than penicillin, and antitetanus treatment is always indicated.

Grade II—moderate venenation; fang or tooth marks present, severe pain, and 15 to 30 cm. of surrounding edema and erythema in the 1st 12 hours after the bite, with systemic involvement—nausea, vomiting, shock or neurotoxic signs present.

Shock may be effectively treated with intravenous infusion of whole blood, plasma, saline solution, and vasopressor drugs. Tourniquet, with incision and suction, is most effective while the venom is localized in a small area. Thirty to 40 ml. of antivenin may be required.

Grade III—severe venenation. Fang or tooth marks present, severe pain, and more than 30 cm. of surrounding edema and erythema in the 1st 12 hours after the bite, with systemic involvement similar to Grade II. Treatment is the same as that given for grades I and II.—*New England J. Med., 263, (Oct. 20, 1960): 789.*

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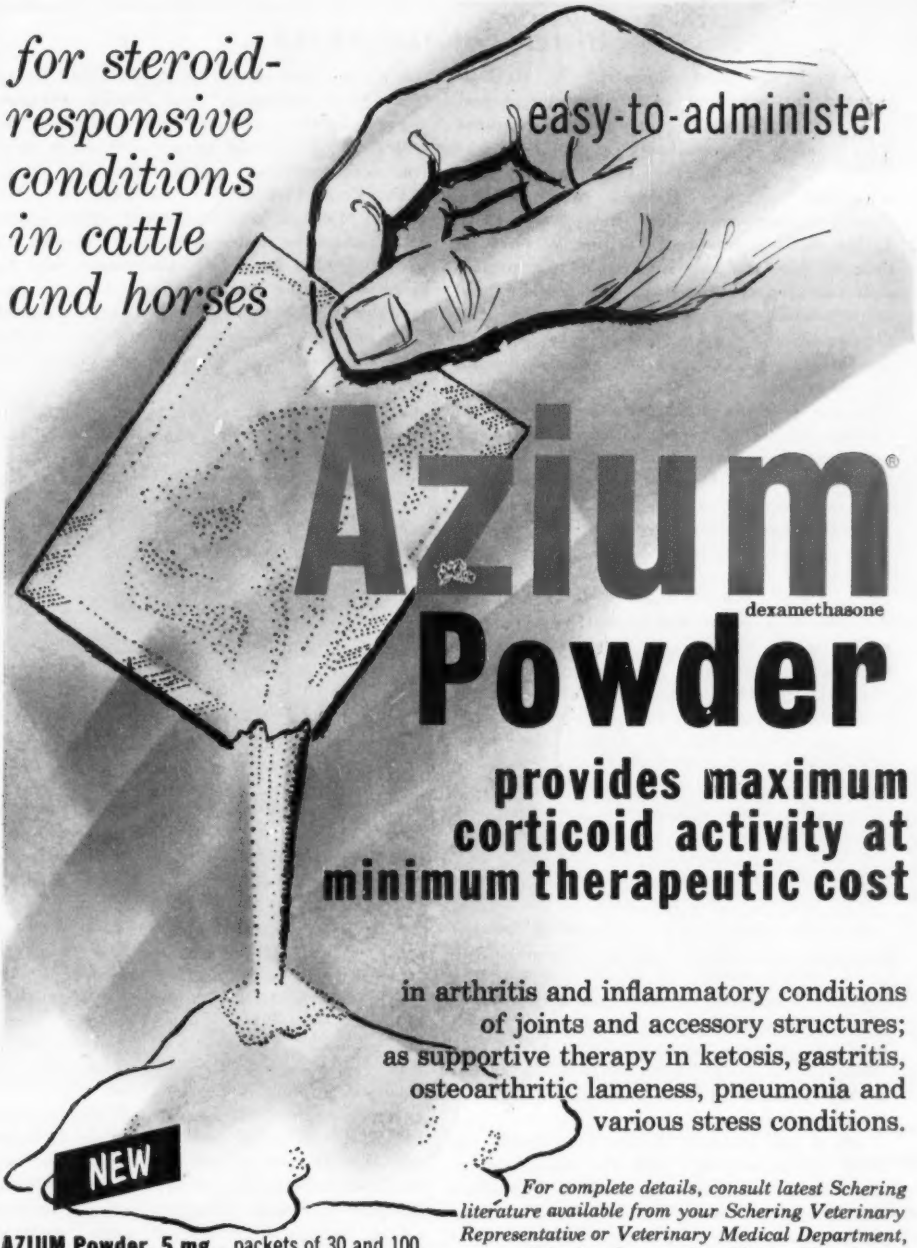

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History of the AVMA

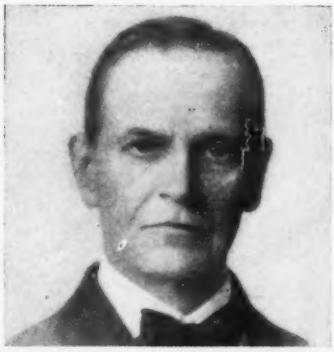
Through the good offices of W. H. Dalrymple, past-president of the Association and long the outstanding exponent of veterinary medicine in the South, the 1914 meeting was scheduled for New Orleans in December. Shortly before convention time, however, C. J. Marshall—undoubtedly acting in what he thought were the best interests of the profession—decided the meeting could not be held as scheduled. A postcard ballot was sent to the membership asking for a vote on postponement, accompanied by the following statement from Dr. Marshall: "As you know aphthous fever exists in 16 states. All federal agents, all state agents in these states and many private practitioners, many of whom are members of the Association, are engaged in exterminating the disease. For this reason it will be impossible for these members to attend the meeting scheduled. . . ."

This, of course, was tantamount to a directed vote, and the cards were sent so late that no other action was logical, or even possible. In commenting on this action, D. M. Campbell names it: ". . . a calamitous thing, absolutely uncalled for . . . . Illinois was hit as hard as any state by foot-and-mouth disease . . . . yet during the first week in December, Illinois veterinarians held the greatest meeting in the history of their association . . . . Even before the announcement of the postponement word came from Washington that the epizootic is completely under control. . . ." The meeting for 1914 was not held.

This void in the proceedings makes it convenient to discuss the re-acquiring of the *American Veterinary Review* as the official organ of the AVMA. In accordance with the expressed opinion of the Executive Board, it had been resolved: ". . . to take such measures as may be necessary to establish an official organ of the association to be known as the *Journal of the American Veterinary Medical Association.*"

When Dr. Liautard returned to France in 1900, he presumably sold his remaining interest in the *Review* to R. R. Bell (already a co-owner), who along with R. W. Ellis continued to edit and publish it. With Dr. Bell at the helm (associate editor since 1896), the *Review* steadily improved in quality and, at his death in 1908, his interest was bought by Dr. Ellis, reputedly for $2,500, the same amount paid by the AVMA for the rights to the journal in 1915. By this time, however, the *Review*—as stated by Merillat and Campbell—"was moribund," and without generous support by the veterinary book publishers and colleges ". . . would have failed as so many American veterinary publications have done."

Dr. P. A. Fish of the New York State Veterinary College was appointed editor—until 1918 when he entered military service. He was succeeded by W. H. Dalrymple, who because of failing health relinquished the post to John R. Mohler in 1919. In 1923 the offices of secretary and editor were combined, with H. Preston Hoskins filling this position until 1939.



Dr. P. A. Fish, first editor of J.A.V.M.A.

PIERRE AUGUSTINE FISH was born at Chatham, N.Y., Feb. 17, 1865. After graduation from Hartwick Seminary in 1885, he received the B.S. (1890) and D.Sc. (1894) degrees from Cornell, the D.V.S. degree from the National Veterinary College in Washington, D.C., in 1896, and the D.V.M. degree from Cornell in 1899. Having worked under V.A. Moore while the latter was with the BAI, Dr. Fish returned to Cornell with Dr. Moore as a member of the first faculty in 1896. Upon retirement of Dr. Moore as dean, Dr. Fish was appointed his successor.

Earlier editor of the *Cornell Veterinarian*, Dr. Fish was appointed first editor of newly acquired *Journal of the American Veterinary Medical Association*. In 1918 he relinquished his post to become a Major in the Veterinary Corps. He was the author of several works on veterinary physiology and therapeutics, and was a frequent contributor to the JOURNAL. He was a vice-president of the AVMA (1908) and president of the New York State Veterinary Medical Society (1915). Dr. Fish died at Ithaca, Feb. 19, 1931.

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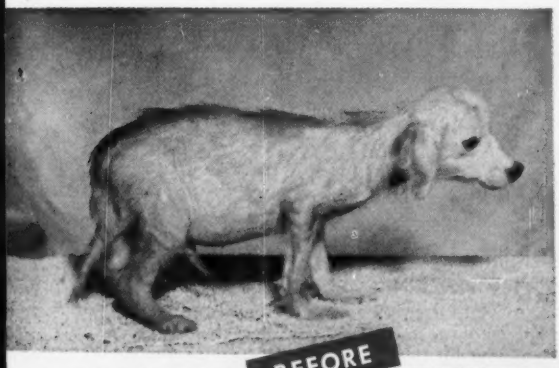

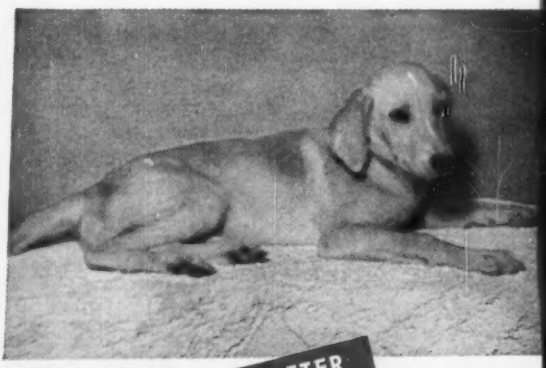

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In accordance with paragraph (c) of Section 1, Article I, of the Bylaws, the names of applicants who are not members of constituent associations shall be published in the JOURNAL. Written comments received by the Executive Secretary from any active member regarding the application as published, will be furnished to the Judicial Council for its consideration prior to acceptance of the application.

BUXTORF, ANDREAS F.
St. Jakobstrasse 183, Muttenz, BL, Switzerland.
D.V.M., University of Zurich, 1940.
Vouchers: Robert T. McCarty and H. Keller

COOPER, IRVEN R., Jr.
21st Medical Det., APO 69, New York, N. Y.
D.V.M., Auburn University, 1944.
Vouchers: D. S. Stevenson and J. E. Wittrock

MERIWETHER, W. F.
Veterinary Detachment, Vancouver Barracks, Vancouver, Wash.
D.V.M., University of Georgia, 1954.
Vouchers: C. N. Thackeray and O. G. Swanson

SCOTT, LYLE, Jr.
328 A. Scott Place, Fort Riley, Kan.
D.V.M., Iowa State University, 1945.
Vouchers: W. E. Jennings and G. H. Zacherle

TRAUTWEIN, GERHARD W.
91 Northwood Apartments, Storrs, Conn.
D.V.M., Veterinary College, Munich, 1952.
Vouchers: C. F. Helmboldt and S. W. Nielsen

WHITNEY, R. A., Jr.
167th Medical Det., APO 154, New York, N. Y.
D.V.M., Oklahoma State University, 1959.
Vouchers: M. S. Oster and G. A. Eddy

WORDEN, ALASTAIR N.
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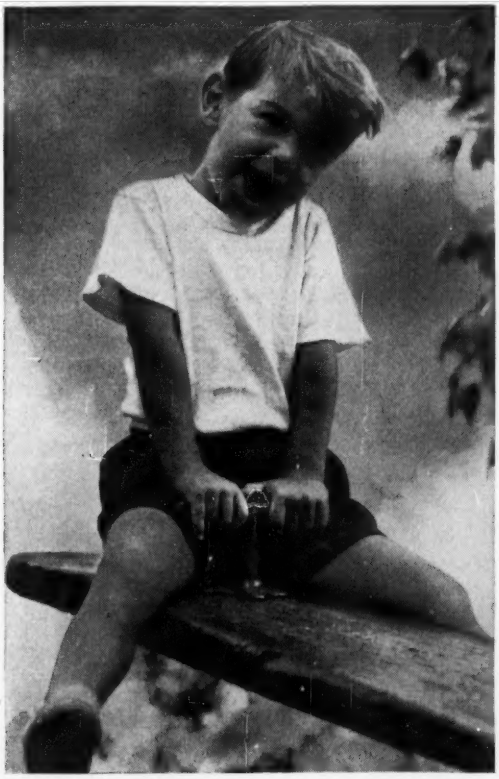

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Public Relations

AVMA Exhibits Will Soon Go "on the Road"

Frequently, during past months, members and affiliated organizations have requested information on exhibit material available from the AVMA. They wish to display the exhibits before their local, state, or regional veterinary meetings or, in some cases, before other health groups or even the general public. The embarrassing reply to these inquiries in the past has been that the AVMA currently has no exhibit material. The inquiries are referred to other agencies who might assist them, such as the Armed Forces, governmental agencies, or other medical and health associations.

To a degree, this position is understandable. Good exhibits are expensive. They require the time and talents of artists and craftsmen of high caliber. An amateur exhibit usually calls attention to little except the lack of skill with which it was produced.

Because their exhibit expenses alone amounted to more than $100,000 per year, one national health association has recently added to its staff an exhibit department employing artists and carpenters. The AVMA is not in a position to afford such an elaborate plan.

But one fact is clear. A good exhibit, tastefully designed, skillfully produced, and directed to the particular interests of its audience is worth its price if viewed by enough people. Good exhibits provide an excellent means of educating and informing large groups of people about the activities of organized veterinary medicine.

At the recent Public Information Round Table (May 20-21), it was the unanimous view of public relations representatives of state and local veterinary associations that the AVMA should provide more assistance in the exhibit field. They recognized that it would be impossible for the AVMA to flood their meetings with elaborate exhibits, but requested that a study be made of over-all exhibit requirements and the costs of correcting the deficiencies.

A committee of the AVMA staff was subsequently appointed to perform the

AVMA in Action—the exhibit which will be remodeled and repainted for use at the 98th Annual AVMA Meeting in Detroit. It describes the benefits of AVMA membership by explaining the AVMA's plans of action.

study. Its members are Dr. James R. Hay, director of professional relations (chairman); Heinz R. Kuehn, director of public information; and Richard D. Morrison, administrative assistant.

As a first step, the committee will revitalize an already existing AVMA exhibit. The exhibit "AVMA in Action" has been taken from storage and will be displayed in Detroit's Cobo Hall at the 98th Annual AVMA Meeting.

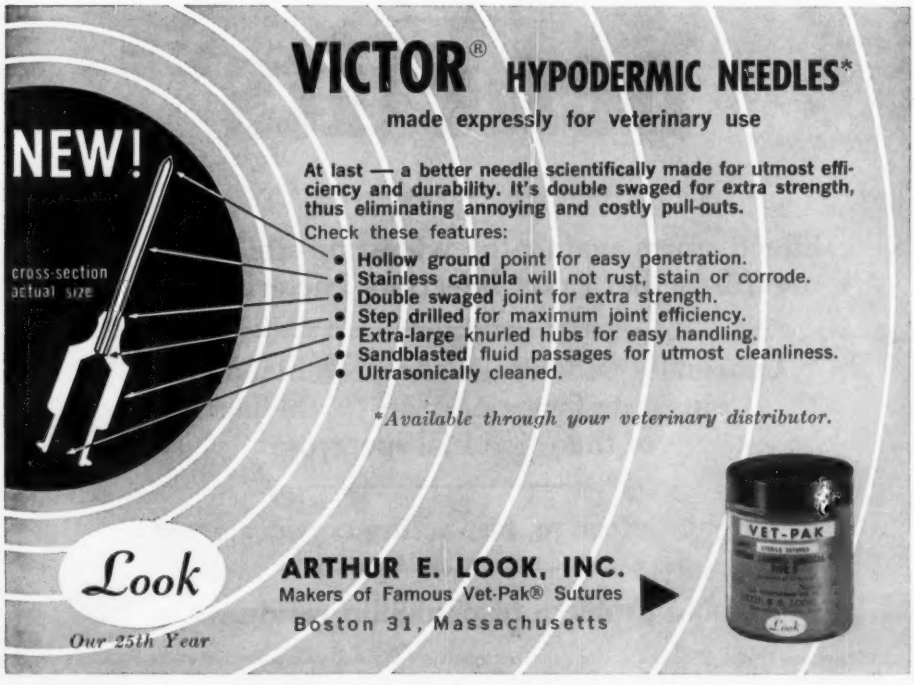
"AVMA in Action" is a large exhibit, approximately 10 feet long and consisting of several sections. A general introduction to the AVMA's structure is given in brief terms in one portion. Two lighted, revolving pylons tell of the AVMA's departmental activity in more detail. Dormant since the Kansas City convention in 1959, this exhibit needs new "story boards" on the pylons and a thorough paint job. When finished, it will tell the latest AVMA story with special attention given to the expanded programs of public information and legislative activities.

Following the Detroit meeting, "AVMA in Action" will be available for loan to veterinary groups who wish to display it before their memberships.

The committee is studying the need for other AVMA exhibits and their costs. Primary consideration will be given to lightweight, flexible, modular units which are adaptable to tell more than one kind of story. Specific panels or "story boards" dealing with a variety of topics could then be inserted into the framework to provide the right information for the right audiences.

The committee will prepare its report at a later date for approval by those who allocate the AVMA budget. If the committee recommendations are allowed, it should be only a short time until the AVMA is able to satisfy the needs of constituent groups for exhibit materials.

R. D. MORRISON
Administrative Assistant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No other mastitis treatment offers all these benefits

Effectiveness against the widest possible range of organisms that cause infectious bacterial mastitis

Unusually wide-range antimicrobial activity plus specific support on "both sides" of the microbial spectrum

Highly-effective, fast-acting corticosteroid

No problem of penicillin residues

Clinical studies under practical conditions in several important dairy areas, have helped establish that Mastalone is effective against almost all of the common bacteria associated with bovine mastitis.

Its unique formulation combines for the first time this balanced group of specific, effective antimicrobial and anti-inflammatory agents for a *true* broad-spectrum treatment in depth . . . but, without the problems of penicillin residues or penicillin resistance.

It offers the unusually wide-range antimicrobial activity of oxytetracycline, plus support on "both sides" of the microbial spectrum with oleandomycin and neomycin—for activity against organisms that may be resistant to penicillin or streptomycin.

Prednisolone, more than twice as effective as hydrocortisone, is added to reduce inflammation and edema, facilitate drainage of exudates and debris, and permit full penetration of the antibiotics.

See your Pfizer representative for complete details.

Warning: Milk taken from dairy animals within 72 hours after the last treatment for mastitis must not be used for food.

COMPARE THE ADVANTAGES OF MASTALONE
with 3 other prominent mastitis preparations

	MASTALONE	Brand A	Brand B	Brand C
Broad-spectrum antibiotic	Yes	No	No	No
Gram-positive coverage	Yes	Yes (weak)	Yes	Yes (weak)
Gram-negative coverage	Yes	Yes	Yes	Yes
Effectiveness against organisms resistant to penicillin	Yes	No	Yes	No
Effectiveness against organisms resistant to streptomycin	Yes	Yes	Yes	Yes
Effectiveness against members of proteus and pseudomonas groups	Yes	Yes	Yes	Yes
Free of penicillin	Yes	No	No	No
Corticosteroid activity	Yes	Yes	Yes	Yes

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Brand of oxytetracycline hydrochloride, oleandomycin, neomycin sulfate, prednisolone (Sterane®) in a special base.

Coming Meetings

Notices of coming meetings must be received 30 days before date of publication.

July, 1961

Arkansas Veterinary Practitioners Association. Aronelle Motel, Hot Springs, Ark., July 16-18, 1961. Dr. James B. Roberts, Booneville, Ark., secretary.

Kentucky Veterinary Medical Association. Fiftieth annual meeting. Sheraton Hotel, Louisville, Ky., July 17-18, 1961. Dr. L. S. Shirrell, 545 E. Main St., Frankfort, Ky., secretary.

Auburn University. Fifty-fourth annual conference for veterinarians. Auburn University, School of Veterinary Medicine, Auburn, Ala., July 23-26, 1961. Dr. J. E. Greene, dean.

August, 1961

International Association of Milk and Food Sanitarians. Golden anniversary meeting. Wanderer Resort Motel, Jekyll Island, Ga., Aug. 14-17, 1961. T. L. Jones, Room 512, 1145 Nineteenth St., N.W., Washington 6, D.C.

American Association of Veterinary Bacteriologists. Annual meeting. Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Aug. 18-19, 1961. C. H. Cunningham, Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, secretary.

American Veterinary Medical Association. Ninety-eighth annual meeting. Sheraton-Cadillac Hotel, Detroit, Mich., Aug. 20-24, 1961. Dr. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

International Association of Microbiological Societies. Seventh International Congress of the Permanent Section on Biological Standardization, London, England, Aug. 28 to Sept. 1, 1961. E. C. Hulse, Ministry of Agriculture, Central Veterinary Laboratory, Weybridge, Surrey, secretary of organizing committee.

Electron Microscope Society of America. 19th annual meeting. Pittsburgh Hilton Hotel, Pittsburgh, Pa., Aug. 23-26, 1961. Dr. A. R. Taylor, Research Division, Parke, Davis and Co., Detroit 32, Mich., program chairman.

September, 1961

Canadian Veterinary Medical Association. 13th annual convention. Banff Springs Hotel, Banff, Alta., Sept. 8-11, 1961. Dr. A. E. Lewis, 403 Public Building, Calgary, Alberta, Canada.

Robert A. Taft Sanitary Engineering Center. Training Program on Milk Pasteurization Controls and Tests. Cincinnati, Ohio, Sept. 12-14, 1961. Chief, Training Program, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

Continued on page 280

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AUGUST 20-24, 1961
DETROIT, MICHIGAN

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(Fees must be submitted with registration form)

AVMA members and their guests	$ 8.00 each
Wives of AVMA members	$ 5.00 each
Children	$ 3.00 each
Nonmembers and guests	$15.00 each
Alumni Dinner Tickets	$ 5.00 each

(Alumni Dinners will be held on Tuesday, August 22)

NOTE: Wives and children must be registered only if they will participate in women's, teens, or subteens' programs. Advance registration closes August 1, 1961. Refunds will be made only if request is received prior to August 7, 1961. Hotel reservations must be made by individual.

Cut on Dotted Line and Return to AVMA, 600 S. Michigan Ave., Chicago 5, Illinois

For ADVANCE REGISTRATION: 98th ANNUAL MEETING OF THE AVMA
August 20-24, Detroit, Michigan

Please register me and others named below in advance and furnish receipt. My check for $ _____ is enclosed.

Name (please print) _____

Complete Address _____

_____

Wife's Name _____

Guest's Name (s) _____ Children's names and ages

_____ _____

_____ _____

Number of Alumni Dinner Tickets _____ School _____

RETURN TO: AVMA, 600 S. Michigan Ave., Chicago 5, Ill.

Coming Meetings—continued from page 278

Animal Care Panel. 12th annual meeting. Statler Hilton Hotel, Boston, Mass., Sept. 27-29, 1961. Dr. Bernard F. Trum, Sherborn, Mass., general chairman.

Oregon Veterinary Medical Association. Fall clinic meeting. Corvallis, Ore., Sept. 28-30, 1961. Dr. K. J. Peterson, Office of the Secretary, Poultry-Veterinary Building, Corvallis, Ore., program chairman.

October, 1961

New England Veterinary Medical Association. Annual meeting. Poland Springs Hotel, Poland Springs, Maine, Oct. 1-4, 1961. Dr. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass., secretary.

Purdue University. 49th annual conference for veterinarians. Purdue University, School of Veterinary Science and Medicine, Lafayette, Ind., Oct. 5-7, 1961. Dr. Erskine V. Morse, Purdue University, School of Veterinary Science and Medicine, Lafayette, Ind., dean.

Symposium on Recent Developments in Research Methods and Instrumentation. 11th annual instrument symposium and research equipment exhibit. National Institutes of Health, Bethesda 14, Md., Oct. 9-12, 1961. Mr. James B. Davis, National Institutes of Health, Bethesda 14, Md., executive secretary.

Eastern Iowa Veterinary Association. Annual meeting. Sheraton Montrose Hotel, Cedar Rapids, Iowa, Oct. 12-13, 1961. Dr. William R. Goodwin, Newhall, Iowa, secretary.

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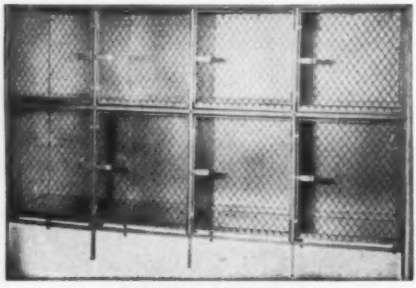

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Illinois Veterinary Medical Conference and Short Course. University of Illinois, Urbana, Oct. 19-20, 1961. Dean C. A. Brandly, College of Veterinary Medicine, University of Illinois, Urbana, Ill.

Gaines Symposium. University of Illinois, Urbana, Ill., Oct. 20, 1961. Mr. Harry Miller, Gaines Dog Research Center, 250 Park Ave., New York 17, N.Y., director of the Dog Research Center.

Midwest Feed Manufacturers' Association. Centennial Nutrition conference, Kansas City, Mo., Oct. 21-25, 1961. Fennell-Gibson Public Relations, 2201 Grand Ave., Kansas City, Mo.

California Veterinary Medical Association. Annual meeting. Long Beach, Calif., Oct. 23-25, 1961. Mr. Kenneth Humphreys, 3004 Sixteenth St., Rooms 301-303, San Francisco 3, Calif., executive secretary.

Missouri, University of. 37th annual veterinary conference. Columbia, Mo., Oct. 30-31, 1961. Dr. Cecil Elder, Department of Veterinary Pathology, School of Veterinary Medicine, University of Missouri, Columbia, Mo., chairman.

United States Livestock Sanitary Association. Curtis Hotel, Minneapolis, Minn., Oct. 30-No. 3, 1961. Dr. Ralph Hendershott, 33 Oak Lane, Trenton, N.J., secretary.

Veterinary Laboratory Diagnosticians. 4th annual meeting. Curtis Hotel, Minneapolis, Minn., Oct. 30-31, 1961. Dr. E. Pope, 4922 Holiday Dr., Madison 5, Wis., secretary.

National Assembly Chief Livestock Sanitary Officials. Curtis Hotel, Minneapolis, Minn., Oct. 30-31, 1961. Dr. M. N. Riemenschneider, 122 State Capitol, Oklahoma City, Okla., secretary.

National Association of Federal Veterinarians. Annual meeting. Curtis Hotel, Minneapolis, Minn., Oct. 31, 1961. Dr. F. L. Herchenroeder, Box 3085, Parkfairfax Station, Alexandria, Va., secretary.

Foreign Meetings

7th International Congress of Biological Standardization. Permanent Section of Biological Standardization of the International Association of Microbiological Societies. Wellcome Foundation Ltd., the Wellcome Building, Euston Rd., London N.W. 1, England. E. C. Hulsa, Ministry of Agriculture, Central Veterinary Laboratory, Weybridge, Surrey, secretary of organizing committee, Aug. 28-Sept. 1, 1961.

Twelfth World's Poultry Congress. Show Grounds of the New South Wales Royal Agricultural Society, Sydney, Australia, Aug. 13-18, 1962. Dr. Cliff D. Carpenter, chairman, U.S. Participation Committee, 1207 Emerald Bay, Laguna Beach, Calif.; Dr. A. William Jasper, secretary, c/o AFBF, 2300 Merchandise Mart, Chicago 54, Ill.

Oldest Veterinary School

The Ecole Nationale Veterinarie de Lyon, recognized as the oldest veterinary school in the world and founded in 1762 by Claude Bougelat, equerry of King Louis XV, will commemorate the bicentennial of its foundation on May 26-27, 1961, in Lyon, France.

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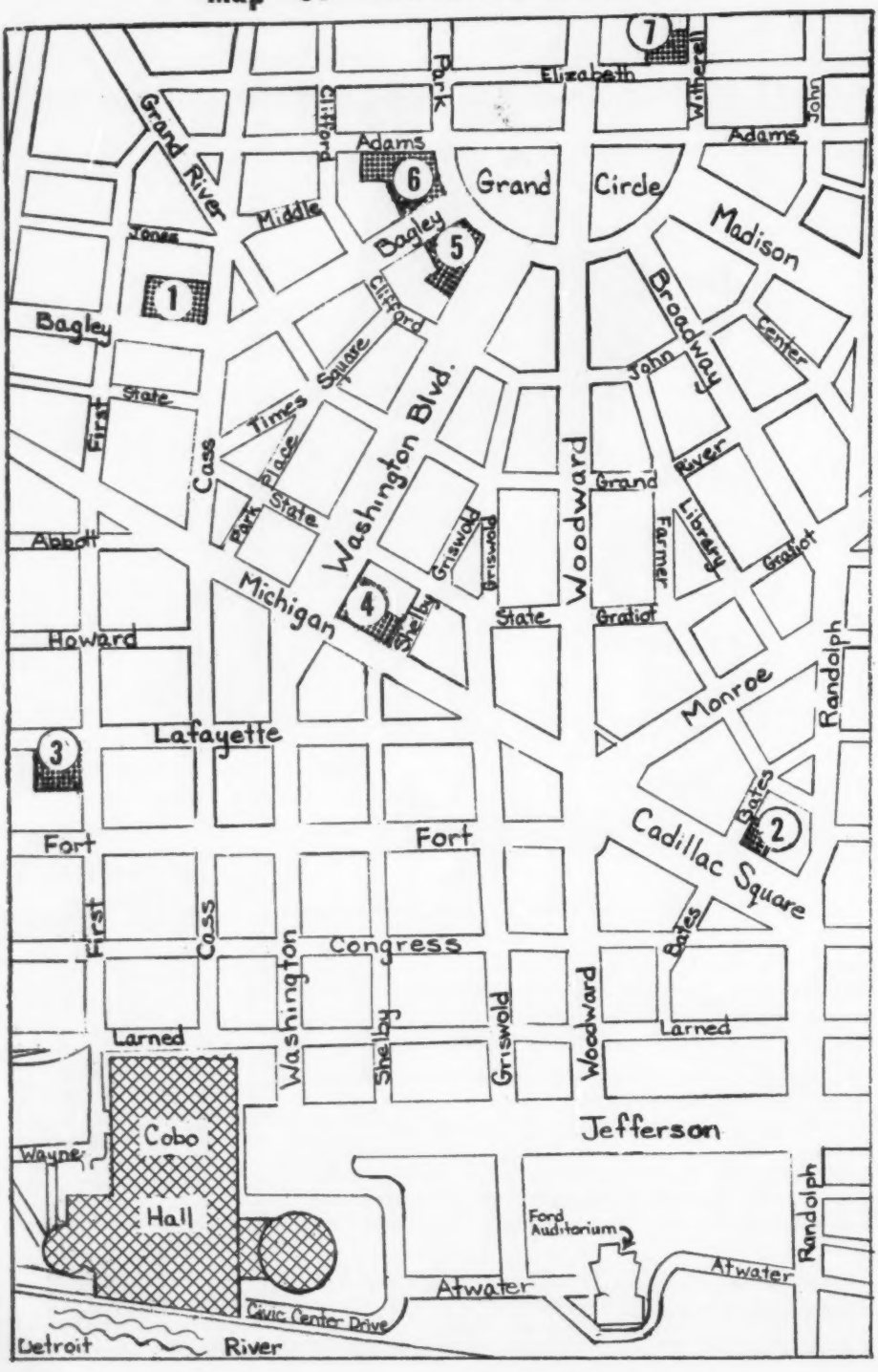

ANNUAL MEETING HOTEL RESERVATION REQUEST

American Veterinary Medical Association

Detroit, Michigan - August 20-24, 1961

INSTRUCTIONS AND INFORMATION

Please give ALL of the information requested below and mail this form to the Detroit Convention and Tourist Bureau. All reservations must be cleared through the Housing Bureau.

Blocs of rooms have been allocated for our use in the hotels which are listed. The Housing Bureau must have the names of all the persons who will occupy each room. No bloc reservations will be made.

Placement will be made in the order received. Your choice of hotels will be followed if rooms are available. Otherwise, assignment will be made to best possible advantage elsewhere. You will receive a confirmation directly from the hotel. (NOTE: All rates are subject to change.) If you desire accommodations in a Detroit hotel not listed or a motel, please so indicate. The Housing Bureau will try to place you there.

FAMILY PLAN — The hotels listed offer a "family plan" whereby children under 14 years of age will be accommodated in the same room with their parents at no extra charge. If more than one room is required to accommodate children, the hotel will charge only the single rate for each additional room.

ANNUAL MEETING HOTELS

Hotel	Singles	For Two Persons		Suites	
		Doubles	Twins	1 Bedroom	2 Bedrooms
1 Detroit-Leland	$7.50-13.50	$10.50-16.00	$12.00-19.00	$25.00-35.00	$38.50-50.50
2 Henrose	6.50-10.50	9.00-13.50	12.50-16.00	25.00	45.00
3 Pick-Fort Shelby	6.00-12.75	9.00-15.50	10.50-16.25	23.00-43.50	39.75-58.75
4 Sheraton-Cadillac (Headquarters Hotel)	8.50-18.00	14.35-20.50	14.85-23.00	29.00-37.50	46.00-56.00
5 Statler Hilton	7.00-13.50	12.50-17.00	14.00-24.50	38.00-44.00	59.50-97.00
6 Tuller	5.00- 9.00	9.00-12.00	10.50-15.00		
7 Wolverine	6.00- 9.00	8.50-10.00	11.00-18.50	25.00	35.00-45.00

APPLICATION FOR HOTEL ACCOMMODATIONS

MAIL TO: Housing Bureau, AVMA
Detroit Convention and Tourist Bureau
626 Book Building
Detroit 26, Michigan

CHOICES OF HOTELS: 1st CHOICE: HOTEL _____ 2nd CHOICE: HOTEL _____

3rd CHOICE: HOTEL _____ 4th CHOICE: HOTEL _____

ACCOMMODATIONS DESIRED: RATE DESIRED:

_____ Room(s) with one bed for one person (Single) $ _____ to $ _____

_____ Room(s) with twin beds for two persons (Twin) $ _____ to $ _____

_____ Room(s) with one bed for two persons (Double) $ _____ to $ _____

_____ Suite(s) parlor and one bedroom $ _____ to $ _____

_____ Suite(s) parlor and two bedrooms $ _____ to $ _____

ARRIVAL TIME: Date _____ Hour _____ DEPARTURE TIME: Date _____ Hour _____

LIST NAMES OF ALL PERSONS WHO WILL OCCUPY EACH ROOM:

Name Street Address City and State

_____

_____

_____

_____

_____

_____

CONFIRM RESERVATION TO: NAME _____

NAME OF COMPANY _____

STREET ADDRESS _____

CITY _____ ZONE _____ STATE _____

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Rabbit Origin

Modified Live Virus Hog Cholera Vaccine

A live virus cholera vaccine of rabbit origin, Corn States' KOLRAVAC is proved thoroughly safe—laboratory tests indicate its inability to induce cholera in vaccinates... to spread cholera to unvaccinated hogs, either directly or by contact with vaccinates... or to transmit other, latent hog diseases. Provides effective, durable immunity.

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Porcine Origin

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1st of month issue — 8th of month preceding date of issue.

15th of month issue — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

Wanted—Veterinarians

Wanted—associate veterinarian for small animal practice on Long Island. Top salary and excellent working conditions. Address Box G 88, JOURNAL of the AVMA.

Wanted—young assistant for equine practice in Central Kentucky. Must be capable, willing to work and learn, must be in upper 40% of his graduating class. Address Box G 85, JOURNAL of the AVMA.

Wanted—recent graduate to assist in modern, well-equipped small animal hospital. Some large animals. Located in large southern city. Salary commensurate with ability. Address Box G 84, JOURNAL of the AVMA.

Wanted—veterinarian with Texas license to assist in small animal practice in Texas city. State age, qualifications. Address Box G 79, JOURNAL of the AVMA.

Wanted—responsible and fully-experienced small animal veterinarian to operate hospital in northern Indiana. Pleasant apartment. Submit detailed resume. Address Box G 75, JOURNAL of the AVMA.

Wanted—California-licensed veterinarian for small animal hospital in southern California. Starting salary for experienced man—$800 per month. Definite raises or percentage for right man. Salary and future for recent graduate would be arranged at interview. Address Box G 74, JOURNAL of the AVMA.

Wanted by pharmaceutical manufacturer—recent graduate to assist in production. Experience not necessary. Give personal history and salary requirements in first letter. Address Box G 55, JOURNAL of the AVMA.

Wanted—recent graduate for high-classed California mixed practice, 2/3 small animals and 1/3 horses. Some beef. Future partnership. Outstanding opportunity. Address Box G 52, JOURNAL of the AVMA.

Positions open for 2 veterinarians. Opportunity for graduate training. West Coast. Salary—$6,672. Address Box G 7, JOURNAL of the AVMA.

Wanted—2 veterinarians. Incumbent 1 will conduct research on pathogenesis, host range, histopathology, immunology, methods of production, growth response, and diagnosis of viruses and viral diseases including the use of tissue culture techniques. Incumbent 2 will conduct clinical and pathological studies of combined infectious and radiation effects in laboratory animals. Applicants with a D.V.M. and M.S. or Ph.D. are preferred. Experience and training in virology will be helpful in first vacancy. Salary—$7,560 to $8,955 per annum; vacancy will be filled in accordance with Federal Government competitive appointment procedures. Send resume to Civilian Personnel Officer, Chemical Corps Biological Laboratories, Fort Detrick, Frederick, Md.

Wanted—assistant veterinarian for small animal hospital in Maryland close to Washington, D. C. Good salary and best working conditions. Start August 20 to September 1. Address Box G 9, JOURNAL of the AVMA.

Wanted—Virginia licensed veterinarian for small animal practice in Richmond. Salary commensurate with ability. Address Box G 19, JOURNAL of the AVMA.

Wanted—assistant veterinarian for northern New England general practice. Opportunity for future interest in practice. State personal data and salary required in first letter. Address Box G 1, JOURNAL of the AVMA.

Veterinarian, 25 to 35 years old, wanted by large midwestern pharmaceutical manufacturer for a technical service position involving travel, speaking and industrial contacts. One to 2 years' experience with large animals and poultry is essential. Please send complete resume, including salary requirements, to Richard Cordell, Personnel Department, Abbott Laboratories, 40 miles north of Chicago on Lake Michigan.

Wanted—veterinarian with Virginia license as assistant for modern small animal practice. Salary commensurate with ability. Substantial future. Address Box F 14, JOURNAL of the AVMA.

Wanted—licensed veterinarian for staff of completely-equipped, modern, AAHA small animal hospital in New York City suburb. Complete details in first letter. Address Box D 56, JOURNAL of the AVMA.

Wanted—Positions

Experienced graduate (OSU '59), married, age 27, desires position in mixed practice leading to partnership. Prefer dairy and small animal. Desire Ohio, Indiana, or Southern Michigan. Address Box G 86, JOURNAL of the AVMA.

Graduate (COL '58) desires position in small animal or mixed practice with future to partnership, lease, or purchase. Also interested in 2-man practice. Licensed in California, Colorado, Wyoming, Kansas, and willing to try for another license if needed. Address Box G 76, JOURNAL of the AVMA.

Middle-aged veterinarian seeks position or assistantship. Southwest or western area preferred. Experienced in large animals and clinical pathology. Address Box G 81, JOURNAL of the AVMA.

English veterinarian with 2 years mixed practice experience seeks position in modern practice, preferably horse and/or small animal. Address Box G 77, JOURNAL of the AVMA.

Veterinarian with 20 years' experience in meat inspection with the USDA desires employment in city meat inspection. Licensed in Indiana, Illinois, Wisconsin, Minnesota, and South Dakota. Address Box G 72, JOURNAL of the AVMA.

Experienced practitioner desires vacation position in progressive small animal hospital leading to partnership or purchase. Address Box G 69, JOURNAL of the AVMA.

Graduate (OSU '58) with experience desires position in Midwest. Licensed in Illinois, Ohio, Wisconsin. Address Box G 68, JOURNAL of the AVMA.

Graduate (OSU '49) with varied experience desires position. Accredited veterinary pathologist, teaching and research at veterinary school, 4 years' administration and research in laboratory animal diseases in prominent cancer research institute; practiced 7 years in own AAHA hospital; 1 year business experience as vice-president of own corporation. Age 39. Address Box G 67, JOURNAL of the AVMA.

Graduate veterinarian with experience in pet practice and in research in clinical toxicology, new drug evaluation, and infectious diseases, will complete military obligation in July, 1962; desires to begin communications leading to clinical investigatory position with large drug company, university or governmental institution. Interested in earning advanced degree under institution support program. Address Box G 54, JOURNAL of the AVMA.

Competent veterinarian desires position in small animal practice, education, or laboratory. Prefer South or Southwest. State details. Address Box G 12, JOURNAL of the AVMA.

Middle-aged mal-content veterinarian possessing varied experience and broad cultural background wishes position with no problems or challenges but high pay. Details in your letter please. Address Box G 10, JOURNAL of the AVMA.

Veterinarian's assistant and receptionist, thoroughly experienced, excellent references, wants live-in position. Widow, aged 45, salary wanted—$50 per week. Prefer southern location. Address Mrs. Cecil M. Cross, 10016 Robsion Rd., Jeffersontown, Ky.

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For sale—eastern Kansas mixed dairy practice. Hospital, residence, radio, instruments, drugs, truck, for $25,000. Nets $10,000. Easy terms. Address Box G 82, JOURNAL of the AVMA.

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For sale—lucrative 10-year-old mixed practice, predominantly large animal, in Monterey County, Calif. Includes new house and small animal hospital with room for expansion. Substantial down payment required. Address Box G 80, JOURNAL of the AVMA.

For sale—small animal practice and hospital in Chattanooga, Tenn. Sale for price of real estate $12,000. Centrally located. Owner wishes to leave due to health and outside interest. Address Box G 78, JOURNAL of the AVMA.

For sale or rent—well-established small animal practice in Brooklyn with living quarters plus apartment for kennel man. Address Box G 73, JOURNAL of the AVMA.

For sale—mixed practice in southeastern Kansas town of 12,000. Building, drugs, equipment, including truck with practice bed, 2-way radio. Priced at one year's gross. Address Box G 53, JOURNAL of the AVMA.

For sale—small animal hospital in southwestern Ohio. Gross—$40,000. $15,000 will handle. Address Box G 3, JOURNAL of the AVMA.

For lease—well-established small animal hospital and 3-bedroom house in San Francisco East Bay area. Gross—$60,000 to $70,000. $7,500 will handle. Address Box G 70, JOURNAL of the AVMA.

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For sale or lease—Chattanooga, Tenn., small animal practice, drugs, and equipment. Forty cages and 20 outside runs. Good location and well-established practice grossing near $30,000 yearly. Price—$8,000. Address Box G 51, JOURNAL of the AVMA.

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For sale—Missouri large animal practice grossing $25,000 annually. Sale price is inventory of drugs and equipment. Terms—cash. Real estate optional. Address Box G 14, JOURNAL of the AVMA.

For sale—established small animal practice. Light horse work available. Heart of Bergen County, N. J. Unique opportunity. Address Box D 16, JOURNAL of the AVMA.

For sale—northeastern Indiana hospital equipped for large and small animals including chute and x-ray. Good mixed practice. Frontage on state highway. Price reasonable. Address Box F 20, JOURNAL of the AVMA.

Wanted—Practices

Wanted to purchase—practice in northern Westchester or southern Connecticut. Address Box G 71, JOURNAL of the AVMA.

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Miscellaneous

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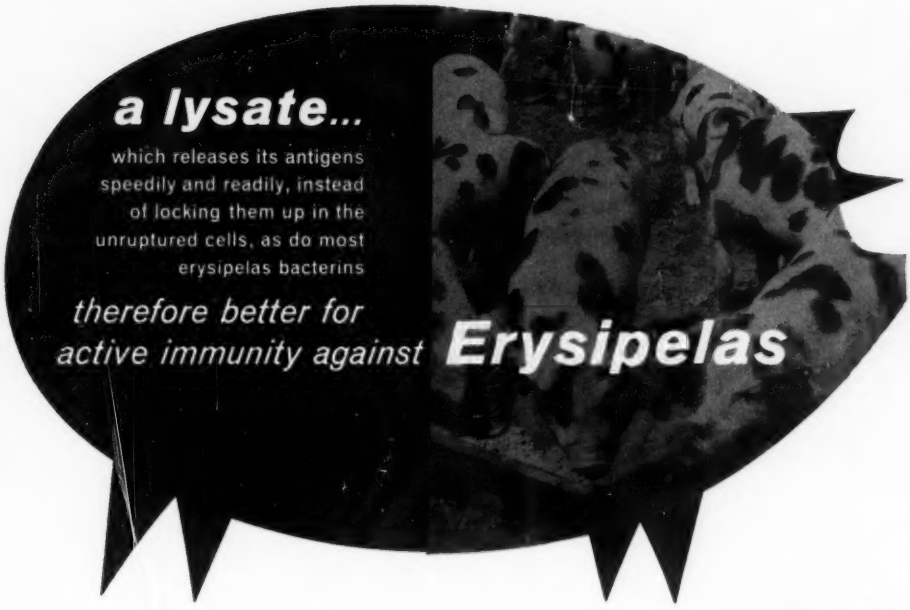
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Clinical and Research References:

1. Sinha, S. K., et al, Studies on Canine Distemper Immunization with a Tissue Culture Vaccine. Vet. Med., Vol. 55, No. 4, April 1960.
2. Burgher, J. A., et al, The Immune Response of Dogs to Distemper. Cornell Vet., Vol. 48, No. 2, 1958.
3. Paton, I. M., et al, Progress in Distemper Immunization. Jen-Sal Small Animal Topics, August 1960.
4. Dept. of Biological Research, Jensen-Salsbery Laboratories. Unpublished Research Data.

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